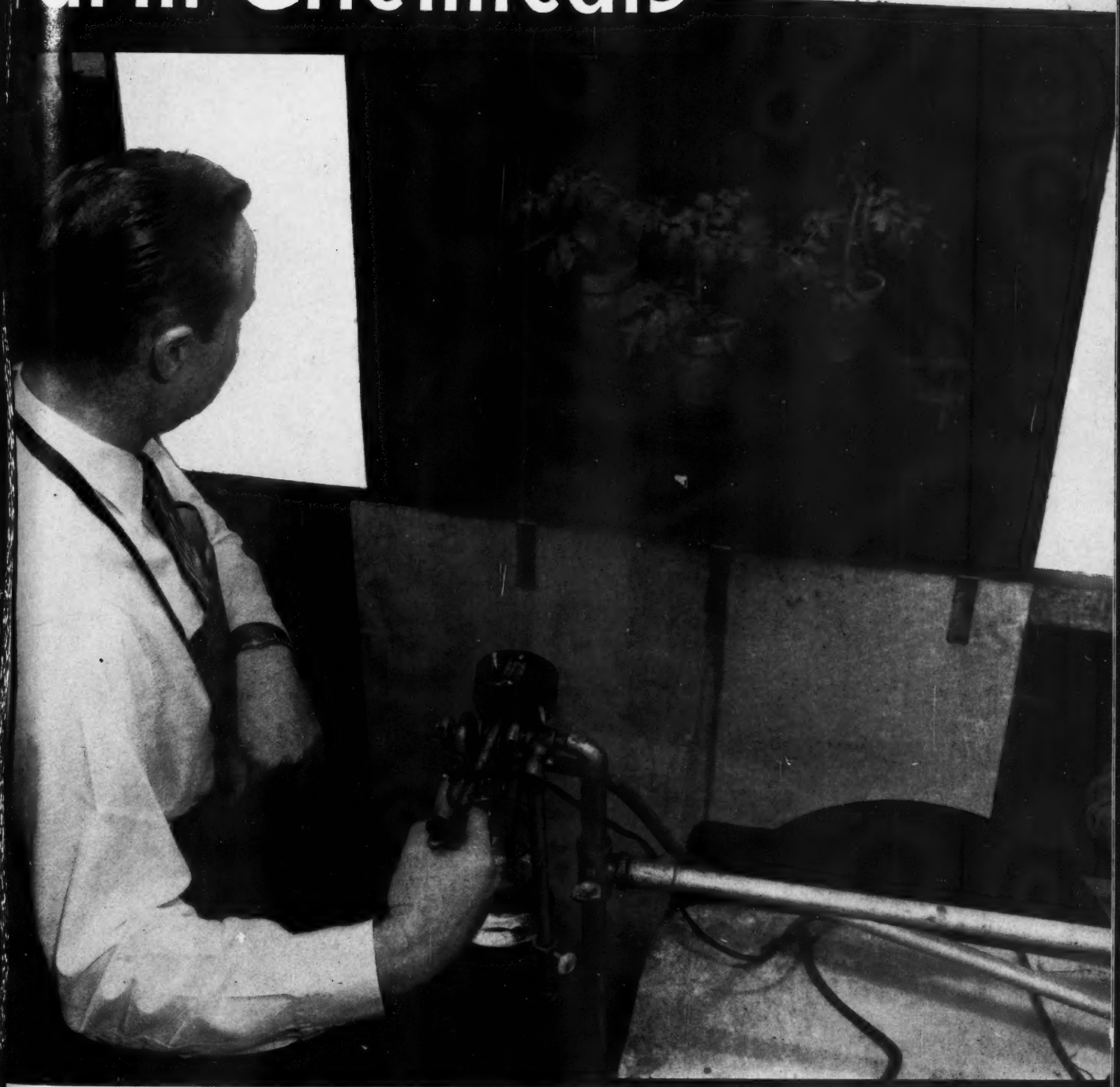
Farm Chemicals



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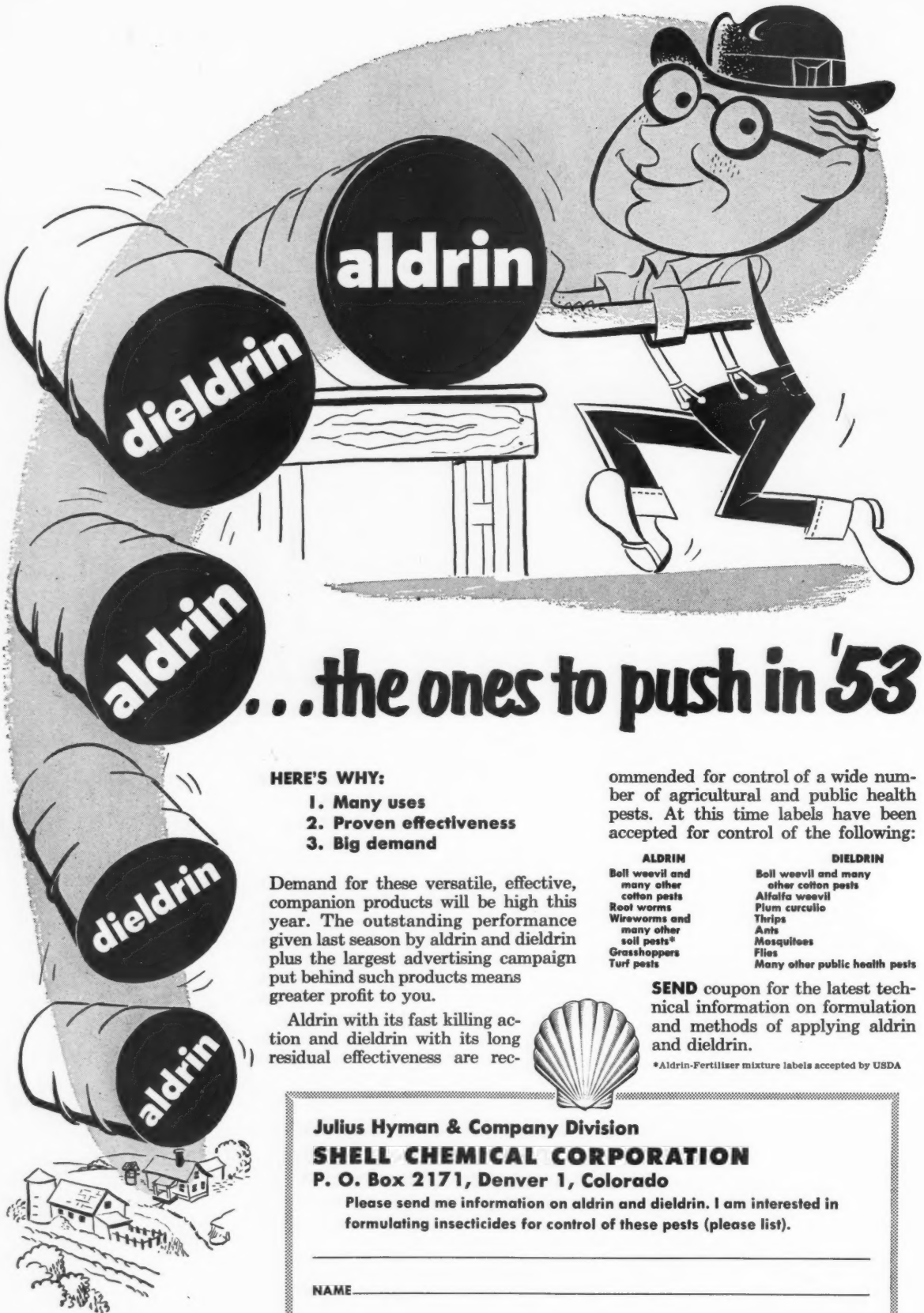

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—Multi-Wall— PAPER SHIPPING SACKS

In this issue . . .

A fairly even mixture of pessimism and optimism was prevalent at the Jung Hotel in New Orleans last month. The occasion, of course, was the annual spring meeting of the National Agricultural Chemicals Association. A gloomy forecast for the current pesticide marketing season was given by President Arthur W. Mohr. Other talks, on new pest control chemicals under development, were more encouraging. For the full story, with pictures, turn to page 12.

How much fertilizer was used and how much is available . . . those two questions are answered in the article starting on page 21. The first portion is a preliminary report on consumption of plant foods in the U. S. during the year ended June 30, 1952. The second is a revised estimate of supplies of chemical fertilizers for the 1952-53 season. Both should be studied closely by members of the fertilizer industry.

When Ethyl Corp. entered the field of farm chemicals a few years ago it did so in a modest manner. Now the organization is in the industry in a big way with construction of a lindane plant in Baton Rouge. For a picture story of the new lindane plant (with largest capacity for producing that pesticide) and other activities at Ethyl, see page 28.

It's either a feast or a famine in this farm chemicals business, the seasonal aspect being what it is, but diversification can help level out the hills and dales. Miller Chemical & Fertilizer Co., in Baltimore, was faced with all the customary problems when it entered the industry. You'll be interested to read about their philosophy of business in the illustrated feature on page 32.

There has been a lot of conflict in the area of introduction and use of pesticides in the past few years. But the Food Protection committee has found some basic considerations in which there is general agreement among government, industry and science. Read about them in the first part of our series on developing pesticides. It starts on page 35.

Fertilizer from seaweed may be news to some members of the industry in this country but it's old stuff on the English Channel Islands Jersey and Guernsey. S. Jepson tells how it's done on page 41.

How pesticides have been developed during the past century in the United States, together with some timely information on recent consumption of the chemicals, as illustrated by usage on cotton, is given in H. H. Shepard's article on page 47.

Increased interest in the United States during the last few years in nitraphosphate manufacture of fertilizer makes the National Fertilizer Association's report on estimated costs of producing an 11-11-11 grade particularly important. NFA's survey is analyzed on page 51.

farm chemicals

Formerly
American Fertilizer & Allied Chemicals
Established 1894
PIONEER JOURNAL OF THE FARM CHEMICALS INDUSTRY

Vol. 116 **APRIL, 1953** **No. 4**

Contents

Cover Story

Biggest news from Ethyl Corp. this month is the new lindane plant in the final stages of construction at Baton Rouge, La. (Story page 28.) But the company is carrying on a lot less spectacular work all the time. At Boyce Thompson Institute for Plant Research, in Yonkers, N. Y., for instance, Ethyl is sponsoring research on many potential farm chemicals. In cover photo a technician tests fungicide.

A magazine international in scope and circulation and devoted to manufacturers, mixers, and formulators of fertilizers and pesticides

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farm chemicals facts

. . . Briefly Noted

New director of information for the Nitrogen Division, Allied Chemical & Dye Corp. is John D. Waugh. Information services, advertising and sales promotion all will be under Waugh's supervision in his new post. He will have his office at division headquarters in New York. Waugh was senior account executive with the public relations firm of Pendray & Co., before joining Nitrogen Division.

Waugh

Increased production of insecticides and other farm chemicals will be made possible by construction of a 12,000 square-foot addition to Geigy Co. Inc.'s Leland, Miss. factory. The addition is a standardized one-story, steelframe structure.

Diamond Alkali Co.'s new miticide plant at Newark, N. J. and lindane plant at Houston, Tex. are listed among four 1952 developments in the long-range expansion and diversification of the company. Diamond spent $17,500,000 during 1952 for the program.

Henry R. Interdonati has resigned from the George Uhe Co. to organize Henry Interdonati Inc. as a broker, sales agent and consultant in insecticides and other materials.

Henry B. Dawson Jr. has been named sales representative in the southern division of Arkell & Smiths. He will work from the Mobile, Ala. office.

Monsanto Chemical Co. has appointed George F. Cech as product sales manager for garden and farm chemicals. Cech will be responsible primarily for sales of the soil conditioner Krilium and Folium, Monsanto's new water-soluble concentrated fertilizer.

Ample burlap supplies and continued competitive prices were promised for 1953 by W. B. Moncur, chairman of the Indian Jute Mills Association at the recent annual meeting of the Calcutta mills, Calcutta, India.

Materials handling will be discussed by 42 speakers representing all types of industries in the United States at the conference on the subject scheduled for Philadelphia, May 18 to 22.

DDT-resistant house flies can be killed with a sulfoxide-pyrethrin insecticide mixture, S. B. Penick & Co. reports. It is claimed to be 12 times as toxic as pyrethrins alone and extends the residual action of pyrethrins.

DuPont employes were a lot safer at their jobs than in their homes, the company states. During January, for instance, more persons were injured away from their jobs than were hurt during all of 1952.

William H. Mason has been appointed assistant to H. A. Gray, vice president in charge of sales of Thurston Chemical Co. Mason has 20 years experience in the fertilizer industry.

That villain the corn borer had a field day during 1952, according to USDA statistics. It destroyed 53 million bushels last year, which represents 1.7 per cent of the 1952 crop or $77 million worth of corn.

Pittsburgh Plate Glass Co. increased its net earnings to $36,771,925, or $4.07 a share during 1952, despite a slight decline in net sales. The company earned $31,075,981 the year before.

Frank Dollard has rejoined the George Uhe Co., Inc. and will handle sales of DDT and other chemicals, the company reports.

CALENDAR

May 7-8—Soil Improvement Committee of Cal. Fert. Assn. Fert. Conf., Marysville, Calif.
May 17-19—Chemical Specialities Mfrs. Assn., Chicago, Ill.
June 11-13—Mfg. Chemists Assn. & SOCMA, White Sulphur Springs, W. Va.
June 11-14—APFC Convention, Hot Springs, W. Va.
June 15-17—NFA Convention, White Sulphur Springs, W. Va.

A program to provide financial assistance to employes seeking to continue their education has been adopted by International Minerals & Chemical Co. International will pay half of tuition, registration and lab fees for regular employes taking courses in accredited institutions.

Controls were lifted on another farm chemical recently when OPS dropped restrictions on coke oven ammonium sulfate. Sellers of the material, however, were cautioned to preserve records but need not keep records of future transactions involving the material.

Lion Oil Co. reported a slight drop in income during 1952 compared with the year before. Net income last year totaled $10,211,245 compared with $11,751,026 in 1951.

Their $13,800,000 phosphate plant at Bonnie, Fla. is nearing completion, International Minerals & Chemical Co. reports. It will use 60,000 tons of sulfur a year to be imported from Louisiana.

William W. Chadwick has been named district sales manager in the New York sales office of the Potash Division, International Minerals & Chemical Corp. Chadwick will be responsible for sale and distribution of potash salts for agricultural uses in the territory. He has been a sales representative in the division's New York office since 1947, having joined the company in 1942.

Chadwick

New general sales manager for Pennsylvania Salt Manufacturing Co. is Albert H. Clem. He fills the position left vacant by the recent death of Russell S. Roeller.

One million man-hours without a lost time accident—that's the impressive record made by workers at the Hopewell plant of Nitrogen Division, Allied Chemical & Dye Corp. The million mark, reached only twice before in the plant's 25 years of operation, was made February 25.

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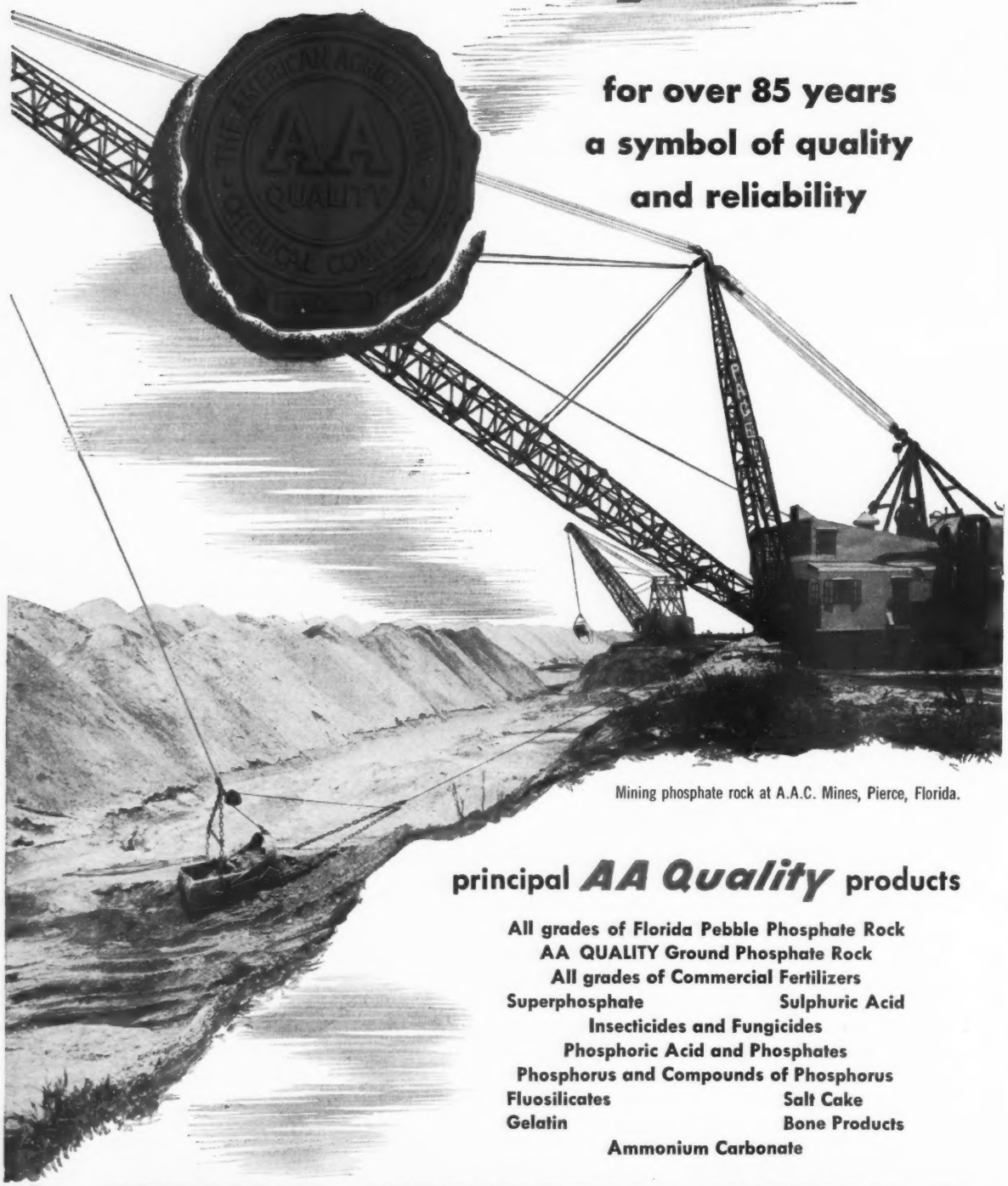

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farm chemicals outlook

Report from Washington
by Fred Bailey & John Harms

Legal snags held up introduction of bills covering chemicals in and on foods by Rep. A. L. Miller (R-Neb.) as we went to press. Miller bills on the subject likely will be the important legislation to watch . . . they are to be substituted for the Delaney bills.

Miller, who has taken on the job of writing the major legislation on chemicals in and on foods, tells us his proposals very likely will be ready for introduction into Congress about the middle of April . . . being held up by legal difficulties and other troubles.

But look for the following details in bills by Miller when they are introduced. Talks with bill-writers bring out the thinking along these lines:

Miller substitutes for the Delaney bills will be written in three spearate pieces of legislation . . . to cover the same fields the two Delaney bills had in mind. Each of these bills will be cut to fit the user and manufacturer it covers.

Miller is dividing the subject into: 1. Food; 2. Pesticides; 3. Cosmetics. Virtue of this division, he explains, is that it separates the various interests affected by the bills. Thus, a feature clearly satisfactory to the farmer, for example, won't hold up passage of legislation because the same feature might be impractical, say, for the food processor.

First bill likely to make an appearance in Congress is the food bill . . . chemicals in foods. Work on the pesticide bill is proceeding at about the same speed and very probably will be tossed into the hopper shortly thereafter.

Look for hearings by House Interstate Commerce Committee soon after the bills appear.

The Miller bills will seek to accomplish the same purpose as the Delaney proposals: Give Food and Drug Administration authority to require the same proof of safety of new chemicals in and on food that is required of drugs, plus providing adequate industry safeguards.

Watch all three Miller bills. What happens on one will be a tip-off on how the others will fare. Regardless for what purpose a chemical is manufactured, if it is to be used for either food, pesticide or cosmetic, proof of safety by the manufacturer will be required before such chemical can move in interstate commerce.

Proof of safety must satisfy the FDA, according to the way the bills are shaping up. It likely will be required in each case all the way down the line of persons "who exploit usage" of chemicals. This is designed to cover the case of users who are not manufacturers, but who produce their own chemicals.

In case of manufacturers, proof of safety that will satisfy FDA will be required before the manufacturer can make any sales claims for the use of the chemical in-on foods, pesticides, or cosmetics.

Legal snag hit by Miller bill-writers arises from Miller's efforts to provide

"adequate" recourse to users or manufacturers who may be dissatisfied with FDA findings.

As of now, only recourse such manufacturers or users have depends on the case they can build in proving that FDA acted arbitrarily or capriciously.

Whether Miller bills will be successful in providing more adequate recourse will depend on settlement of an old argument: The constitutional question of a court's jurisdiction on deciding "administrative matters."

Miller bills likely will propose to provide for such judicial review where user or manufacturer wants to contest an FDA decision. As the bills are being written, FDA decisions would be in force until the courts decided.

When a manufacturer or user offers proof to FDA of safety of a new chemical, FDA would have 60 days in which to make a decision . . . in some cases this could be extended to 180 days, as Miller thinking now goes.

Miller regards the Delaney bill definition of what constitutes a chemical additive as too far-reaching . . . ham-stringing to the industry. He plans to place the emphasis of any legislation he proposes in the field on safety to the public, rather than economic necessity of industry.

Industry might be able to use some chemicals under laws proposed by Miller that are now prohibited. That's a possibility pointed out by some legal-minded observers here.

At the time of writing, Miller was considering ruling out of a definition of chemical additives those chemicals now regulated under the Federal Insecticide Act.

Health of the American people has improved in almost direct proportion to increased use of chemicals on soils. That statement was made by Romeo E. Short, Director of USDA Agricultural Credit Services, at a conference of rural health.

It's a tip-off to some of the thinking in the top echelons of the new USDA administration. It indicates that chemical industry relations with this important part of the government are to be generally on a sound basis.

However . . . look for USDA support for a slash in agricultural conservation practice funds. Sec. Benson, in his USDA economy crusade, is looking for ways of chopping down the agriculture budget . . . ACP subsidy is about the only big possibility for cutting.

Any proposal to cut payments for use of lime and fertilizer, however, will run into considerable opposition in Congress . . . headed by Sen. George Aiken (R-Vt.) chairman of the Agriculture Committee. Aiken favors continuation of payments for lime, especially, as "at least a semi-permanent agricultural practice."

Diphenyl, new chemical treatment to retard decay of packed oranges, has been found to be a poisonous or deleterious substance by FDA. We are informed that users now have three choices: 1. Stop using the chemical on oranges . . . 2. Ask FDA for a hearing . . . 3. Wait for possible government seizure in interstate commerce of orange shipments.

FDA is ready to get tough in the drive to clean up shipments of grain, especially wheat. Campaign is scheduled to begin July 1 . . . and emphasizes removal of grubs and other insects from grain headed for the miller. Grain trade has lined up USDA in efforts to postpone beginning of the drive.

USDA exploratory research, now being publicized, has succeeded in killing cattle grubs by injecting chemicals into the blood stream. Chemicals used as systemics in cattle during the tests are aldrin, dieldrin and lindane.

The tests indicate a whole new field for the chemical industry . . . if they prove out both economical and safe for use by the farmer. But USDA is not making recommendations at this time . . . tests so far are only preliminary.

USDA is recommending chemical weed killers to farmers as an important means of continuing high production of many crops . . . at the same time cutting production costs. USDA says: "Today's chemical weed killers help to produce corn efficiently and economically."

High inventories, dropping prices give dim outlook.

By Sam Lewis Veitch

Publisher

IN a setting of an old country atmosphere, steeped deep in tradition, New Orleans played host to nearly 400 members attending the spring meeting of the National Agricultural Chemicals Association. The convention was held March 11 to 13 in the hospitable Jung Hotel.

Theme of the meeting was the use of chemicals to reduce crop loss from insects and weeds and to increase production through enrichment of the soil.

A gala banquet and tours of the historic Gulf city added interest and entertainment to the three-day meeting, but it was not without its more serious moments.

Gloomy Outlook

Most ominous, perhaps, was the warning sounded by Arthur W. Mohr, NAC president and head of California Spray-Chemical Corp.

Mohr said it was his "unpleasant duty" to forecast an "unprofitable year" for the industry.

"At present," he advised, "manufacturing capacity for most agri-

1. **Val E. Weyl, center, NAC, watches L. H. Grobe, NAC, and Inez Gibson, City C. of C. register guests.**

2. **Jim Conner, Jr., Taylor Chem. Co., G. F. Leonard, Tobacco By-Products & Chem. Corp., J. M. Taylor, Taylor Chemical Co., B. P. Webster, Chipman Chem. Co., Inc. and F. W. Hatch, Julius Hyman & Co., Div. of Shell Chem. Corp. at the banquet.**

3. **Silas Besthoff, Faesy & Besthoff, E. N. Shelton, Tenn. Corp., C. G. Whinfrey, Penna. Salt Mfg. Co. and L. S. Kaniecki, Tenn. Corp., take time for a smoke between sessions.**

4. **Two NAC staff members, J. A. Noone and Lea S. Hitchner, have a talk.**

NAC Prepares for 'Unprofitable Year'

cultural chemicals is much greater than the demand, so it appears that prices may remain low and that as an industry the profits may be meager if there are any at all."

The association president added that this is not a "happy or healthy" situation but a "realistic" one.

He added that pesticides may mean the difference between profit and loss during this period of falling farm prices.

He said loss of crop values because of attacks by pests is estimated at $13 million annually and called for the agricultural chemical industry to get the proper facts to farmers who are permitting pests to eat into their income.

As examples, Mohr explained that peanut yields can be almost doubled by control of the corn root-worm, making possible a gain up to $200 an acre. He added that cost of weeding cotton with chemicals is approximately $5 an acre, whereas hand weeding costs from three or four times as much.

Chemical Weed Control

Warren C. Shaw, USDA agronomist, at the Bureau of Plant Industry, Beltsville, Md., cited the work of the experiment station there in weed control through the use of chemicals.

Dwelling primarily on the use of herbicides, he said the annual American farm loss caused by weeds is estimated at $5 billion. This loss can be considerably reduced, he said, by spraying crop and noncrop lands with 2, 4–D.

Herbicides are being applied to lands as pre-emergence and post-emergence sprays as a preventive and killer respectively, he said, pointing out that last year more than 18 million acres of cereal lands, nearly five million acres of corn and three-quarters of a million acres of cotton were sprayed with 2, 4–D.

"Research means we will develop more uses for herbicides. This research is designed to determine the effect on crops and weeds," he said. "We're conducting fundamental studies at Beltsville to determine how to kill weeds and under what conditions weed killing chemicals are to be used."

Dr. A. F. Camp, vice director of the Florida Experiment Station, Lake Alfred, Fla., said experiments have shown that unproductive land can be turned into productive land by soil analysis and by enriching the soil with the various minerals needed to produce certain crops.

However, he warned against treating the soil with an excessive amount of the necessary mineral needed for a particular crop be-

Cameron Siddall, Penna. Salt Mfg. Co. of Wash., left, talks with Dr. T. W. Brasfield, Dr. Harry Glenn and W. E. Akin of U. S. Rubber Company.

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cause it would create deficiencies in other elements. Any mineral or other element must be applied in the right proportion to the amount of deficiency to obtain the best results, he said.

Ellender Talks

Senator Allen J. Ellender (D-La.) cited the necessity for protecting the land so that production will keep pace with increasing demands in the next two decades.

"The three keys to agricultural abundance two decades hence are soil conservation, agricultural research and maximum use of farm chemicals," Ellender declared.

"No matter how much money and effort we pour into a program to improve our soil conditions, our total investment is lost unless adequate measures are taken to reduce the 10 to 40 per cent loss caused by agricultural pests."

Ellender said the South is suffering from a one-crop system hangover and "there is ample evidence in too many instances that some farmers are waiting until the soil is worn out before taking steps to improve it."

Avery S. Hoyt, chief, USDA, Bureau of Entomology and Plant Quarantine, in a paper read by H. L. Haller, assistant chief, described the resistance to insecticides by some major pests as "the modern entomological headache."

The problem, he said, is not limited to resistant houseflies, mosquitoes, roaches or body lice, but is of a much more widespread nature.

Codling Moth Problem

"It is the codling moth problem, the Colorado potato beetle and others that materially affect our food and feed supplies," he asserted. He warned that "we

1. **F. W. Hatch, J. Hyman & Co., Div. of Shell Chem. Corp., talks with B. P. Webster, Chipman Chem. Co., Inc.**

2. **Robt. Peacock, General Reduction Co. meets with George W. Oliver and E. W. Cannon of Cal. Spray.**

3. **Talking before the banquet are A. H. Carter, Sherwin-Williams Co. of Can., Ernest Hart, Food Mach. & Chem. Corp. and G. F. Leonard, Tobacco By-Products & Chem. Corp.**

4. **John Chase, center, Port Fertilizer & Chemical Co., gets together with Dr. J. G. Utter, left, and J. G. Brunton, Kolker Chem. Works, Inc.**

don't know just how long present insecticidal controls, most of them still remarkably effective, will continue to help farmers give this nation bumper crops of food, feed and fiber so necessary to present high standards of living."

E. C. McClintic, vice president of the Pure Carbonic Company, New York, discussed the importance of transportation and a good traffic department to help widen the markets and open new sources of raw materials.

Dr. Charles E. Palm, president of the Entomological Society of America and head of the Department of Entomology of Cornell University, declared that "Through pest control, there is a real opportunity to contribute toward the solution of fundamental sociological problems behind world unrest."

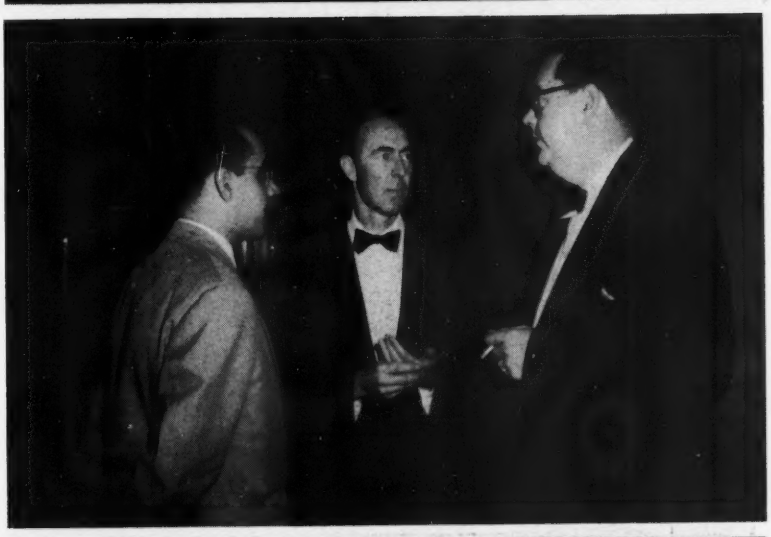
He predicted that in the future an even greater demand will be placed on science to supply the materials needed for support of the increasing population of the world. "Science fortunately does not recognize the political boundaries that may be forced upon its products," he said. The American farmer has better individual understanding of pest control problems than any farmer in the world, he stated. He attributed this understanding largely to the educational programs of the Land Grant Colleges, Extension services and the chemical industry of this country.

H. G. Johnston said tremendous interest has developed during recent years in systemic insecticides.

Systemic Progress

The idea of introducing chemicals into the sap-stream of plants to kill insects is by no means new,

(*Continued on page 72*)



1. **Enjoying themselves after dinner are J. V. Miller, Atlas Powder Co., Mrs. E. A. Epps, Baton Rouge, La., H. O. Whamond, Velsicol Corp., and J. T. Conner, Jr. Taylor Chem. Co.**

2. **D. L. Kent, B. F. Goodrich Chem. Co., Friar Thompson, Athens, Ga. and W. J. Haude, Pittsburgh Agricultural Chemical Corporation exchange views in the lobby.**

3. **Relaxing at the convention are T. L. Bendall, The Dow Chem. Co. and W. F. Hall, Chipman Chem. Co.**

4. **E. R. Marshall, GLF Soil Building Service, visits with J. A. Field and J. A. Lambrech, Union Carbide & Carbon Corp. in the Jung Hotel.**

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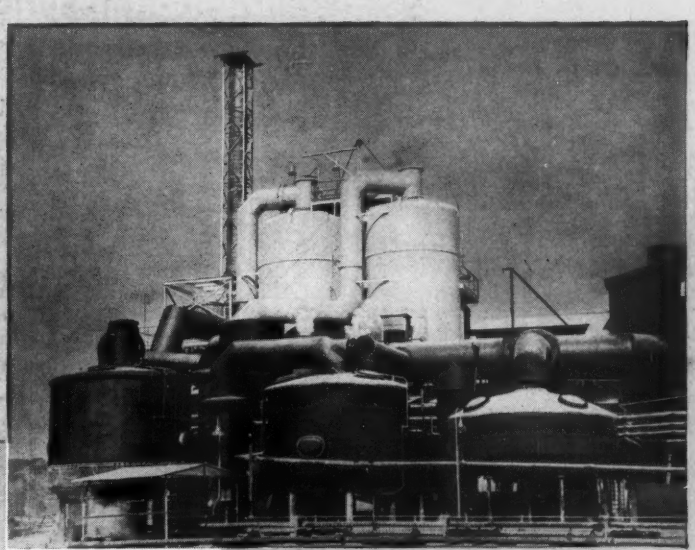
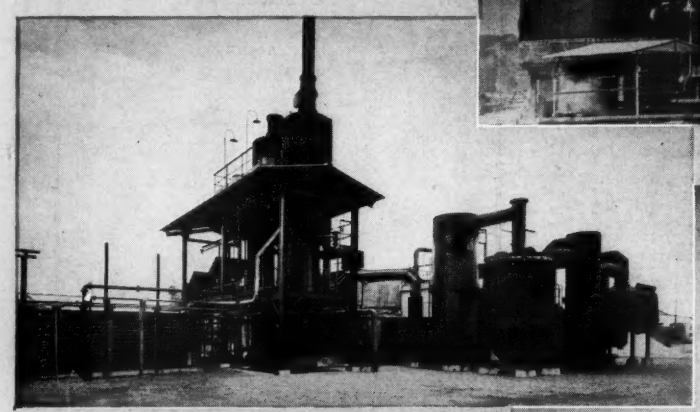
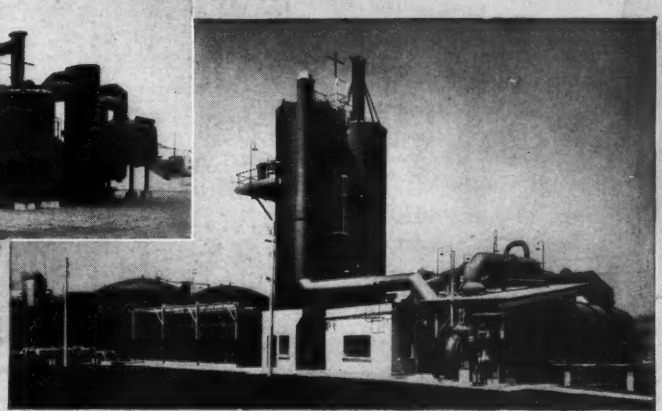


500 Tons



50 Tons



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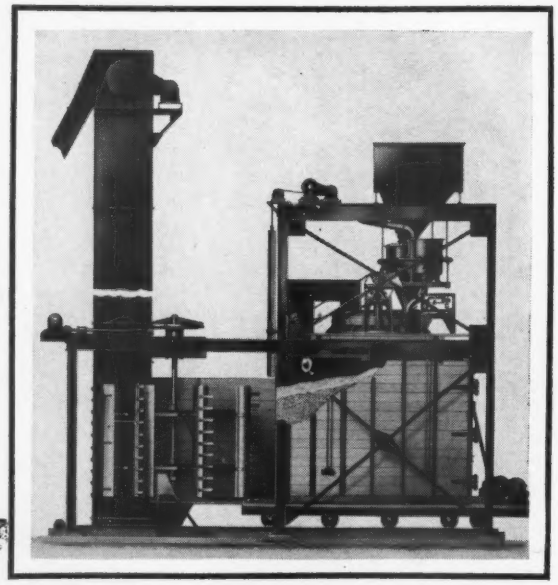

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FERTILIZER: Consumption In '52, Supplies for '53

AN increase in consumption of chemical fertilizer in the United States was made during the year ended June 30, 1952.

The rise was 1.4 million tons of fertilizer, with total consumption set at 22.4 million tons.

The increase, estimated from data presently available, represents a 6.8 per cent jump over the consumption of 20,988,740 tons reported in 1950-51.[1]

Commercial mixtures, 15.1 million tons, constituted 67.3 per cent of this total. The other 32.7 per cent was composed of 6.5 million tons of materials guaranteed to contain N, P_2O_5, or K_2O and 0.8 million tons of other materials mainly gypsum.

Nearly Complete

Consumption of fertilizer, by states, regions and classes is given in Table 1. Totals for most of the states are considered complete. Totals for those states indicated as "estimates" possibly may be changed in a later report.

The preliminary total for the United States probably is within 75 thousand tons of the final total.

Fertilizer Distribution

Distribution of fertilizer, by regions, over the 10-year period (1942-43 to 1951-52) is given in Table 2. The use of fertilizer in 1951-52 was 11 million tons (96 per cent) greater than in 1942-43.

The increase in use of fertilizer during this 10-year period was greatest in the East North Central region with 2.9 million tons.

FARM CHEMICALS *presents herewith two reports of vital concern to members of the fertilizer industry. The first is a preliminary report on consumption of chemical fertilizer in the U. S. during the year ended June 30, 1952. The second revises estimates on supplies of plant foods for the 1952–53 season.*

The first report was made available for publication by Walter Scholl and Hilda M. Wallace of the USDA, the second by L. G. Porter and M. M. Johnson of the Production and Marketing Administration.

In the South Atlantic region, it was 1.8 million tons and 1.4 million tons in each of the following regions: East South Central, West North Central and Pacific. The quantity of fertilizer consumed annually in New England has changed little during the 10-year period. The trend in quantity of fertilizer consumed, by regions, is shown graphically in Figure 1.

The relative change in the quantity of fertilizer consumed annually also is shown in Table 2. The increase in consumption for regions along the Atlantic coast has occurred with lesser variations in rates of increases or decreases than for most other regions. The weighted average rate of change has ranged between 7.8 per cent and minus 2.3 per cent.

For the North Central regions, the rate of increase was greater from 1942-43 to 1945-46, reaching 23.3 per cent. From 1945-46, their rate of increase was downward until in 1949-50 consumption was 3.4 per cent less than for the preceding year.

Rate of Increase

A rapid recovery was made in 1950-51 when consumption was 18.6 per cent greater than for the preceding year but dropped to an increase of 14.9 per cent in 1951-52.

Average rate for the South Central regions has ranged between 19.0 and 0.9 per cent. High increases and low increases usually have occurred in alternate years. Widest range of rate of change has occurred for the Mountain and Pacific regions. Those rates have varied between an increase of 72.0 per cent to a decrease of 9.3 per cent.

Upward Trend

In general, rate of change in the use of fertilizer showed an upward trend from 1942-43 to 1945-46. From 1945-46 to 1949-50, the rate was downward, reaching a low in 1949-50, when consumption was 1.1 per cent less than for the preceding year.

The rate turned upward in 1950-51 when consumption was 14.4 per cent greater than the preceding year and downward in 1951-52 when consumption was only 6.8 per cent more than in 1950-51.

See figures on consumption of fertilizers, page 22; supplies, page 24 in this issue.

Table 1. Preliminary Consumption of Fertilizers in the United States, Year Ended June 30, 1952[1]

State & Region	Consumption				
	Commercial Fertilizers Guaranteed to Contain N, P_2O_5, or K_2O			Minor and Secondary Element Materials[3]	Grand Total All Fertilizers and Minor and Secondary Element Materials
	Mixtures	Materials[2]	Total		
	Tons	Tons	Tons	Tons	Tons
Maine	201,458	14,376	215,834	71	215,905
New Hampshire	15,148	5,793	20,941	81	21,022
Vermont	38,650	17,380	56,030	35	56,065
Massachusetts	74,248	17,746	91,994	85	92,079
Rhode Island[4]	13,200	2,400	15,600	10	15,610
Connecticut	58,548	27,795	86,343	891	87,234
New England[4]	401,252	85,490	486,742	1,173	487,916
New York	486,612	147,713	634,325	592	634,917
New Jersey	241,011	23,854	264,865	117	264,982
Pennsylvania	567,816	96,067	663,883	972	664,855
Delaware	74,109	6,171	80,280	107	80,387
District of Columbia	1,731	810	2,541	0	2,541
Maryland[4]	263,000	26,700	289,700	300	290,000
West Virginia	73,135	26,738	99,873	5	99,878
Middle Atlantic[4]	1,707,414	328,053	2,035,467	2,093	2,037,560
Virginia	739,727	120,383	860,110	8,801	868,911
North Carolina	1,571,194	343,022	1,914,216	27,716	1,941,932
South Carolina	716,301	258,238	976,539	2,562	979,101
Georgia	1,079,363	238,853	1,318,216	14,114	1,332,330
Florida	973,566	93,465	1,067,030	21,569	1,088,599
South Atlantic	5,082,150	1,053,961	6,136,111	74,762	6,210,873
Ohio	983,441	66,020	1,049,461	86	1,049,547
Indiana	934,174	148,440	1,082,614	47	1,082,661
Illinois	592,207	842,094	1,434,301	47	1,434,348
Michigan	536,560	53,949	590,509	412	590,921
Wisconsin	350,858	42,695	393,553	210	393,763
East North Central	3,397,240	1,153,198	4,550,438	802	4,551,240
Minnesota	171,202	52,382	223,584	1,522	225,106
Iowa	277,846	149,078	426,924	4	426,928
Missouri	427,830	325,249	753,079	16	753,095
North Dakota	21,475	9,673	31,148	0	31,148
South Dakota	5,633	5,661	11,294	0	11,294
Nebraska	31,840	60,591	92,431	0	92,431
Kansas	84,586	123,104	207,690	0	207,690
West North Central	1,020,414	725,736	1,746,150	1,542	1,747,692
Kentucky	482,962	147,149	630,101	18	630,119
Tennessee	445,327	159,337	602,564	196	602,760
Alabama	854,544	466,401	1,321,045	484	1,321,529
Mississippi	370,333	454,694	825,527	1	825,528
East South Central	2,151,856	1,227,581	3,379,437	699	3,380,136
Arkansas	188,068	169,987	358,055	1	358,056
Louisiana	179,374	146,298	325,672	6	325,678
Oklahoma	65,018	107,537	172,555	0	172,555
Texas	293,481	313,961	607,442	7,922	615,364
West South Central	725,941	737,983	1,463,824	7,929	1,471,753
Montana	3,279	19,502	22,781	462	23,243
Idaho	11,637	55,759	67,296	4,348	71,644
Wyoming	671	6,010	6,681	75	6,756
Colorado[4]	14,000	30,000	44,000	600	44,600
New Mexico	1,520	17,560	19,080	0	19,080
Arizona[4]	24,500	78,000	102,500	15,000	117,500
Utah	2,579	27,524	30,103	430	30,533
Nevada[4]	350	1,550	1,900	600	2,500
Mountain[4]	58,436	236,005	294,441	21,515	315,956
Washington	26,722	61,939	88,661	2,987	91,648
Oregon	20,298	86,677	106,975	13,333	120,308
California	214,353	747,783	962,136	664,965	1,627,101
Pacific	261,373	896,399	1,157,772	681,285	1,839,057
Continental United States					
1951-52[4]	14,906,078	6,444,306	21,250,382	791,800	22,042,182
1950-51	13,540,406	6,222,164	19,762,570	645,350	20,507,920
1949-50	12,036,043	5,502,207	17,538,250	439,382	17,977,632
Hawaii	55,635	60,042	115,677	104	115,681
Puerto Rico	222,193	41,784	263,977	0	263,977
Alaska	117	446	563	0	563
Territories	277,945	102,272	380,117	104	380,221
United States including Territories					
1951-52[4]	15,083,921	6,546,578	21,630,499	791,904	22,422,403
1950-51	13,977,350	6,365,449	20,343,299	645,441	20,988,740
1949-50	12,297,596	5,606,197	17,903,793	439,607	18,343,300

1/ Includes fertilizers distributed by Government agencies.

2/ Includes: Ground phosphate rock, basic slag, dried or processed manures but not unmanipulated manures, sewage sludges, and all other materials guaranteed to contain N, P_2O_5, or K_2O supplied for direct use in agriculture. Excludes the quantity of materials consumed in the manufacture of commercial mixtures.

3/ Includes only those materials supplied by manufacturers of commercial fertilizers, such as borax, sulfur, gypsum, metallic salts, not guaranteed to contain N, P_2O_5 or K_2O. Does not include liming materials, or the quantity of minor and secondary element materials supplied through sources other than manufacturers of commercial fertilizers.

4/ Estimated

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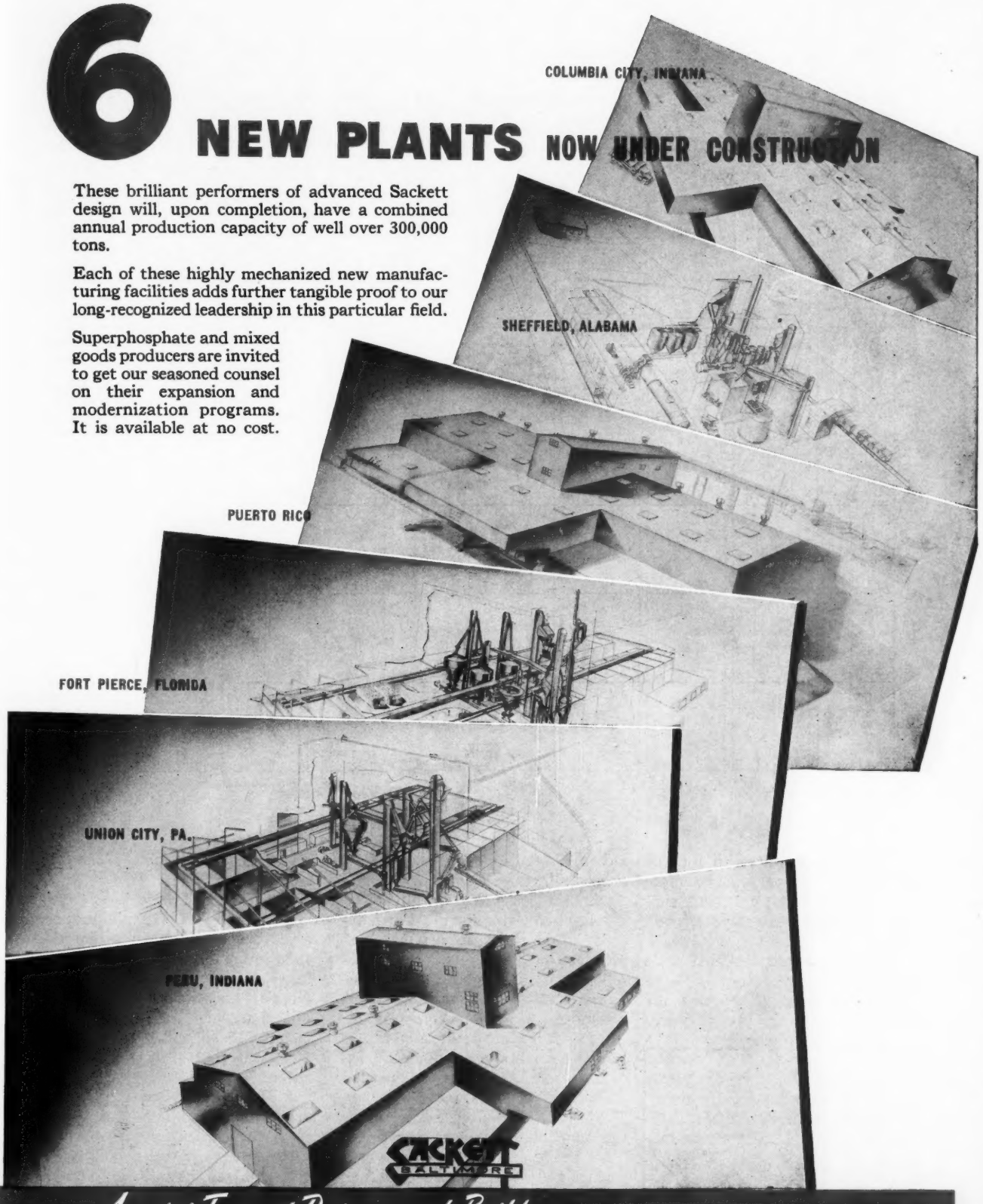

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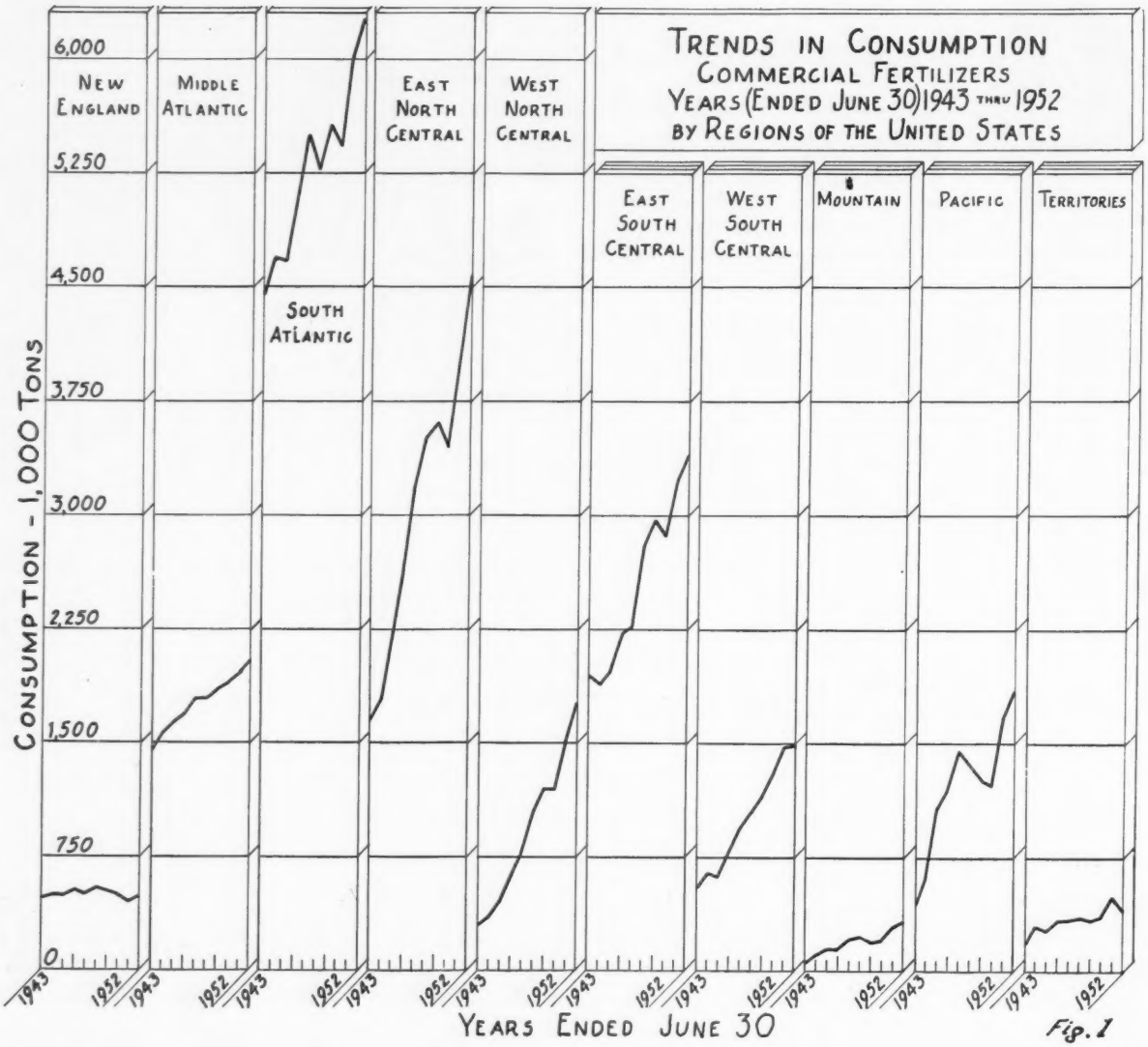

Fig. 1

SUPPLIES of nitrogen for the 1952-53 season will be more than expected last fall, but supplies of phosphates and potash will be less.

These facts are revealed in a supplemental report on the fertilizer situation for this period. It is a fertilizer staff report prepared by L. G. Porter and M. M. Johnson, of the Production and Marketing Administration, U. S. Department of Agriculture.

Revisions should be compared with earlier estimates on fertilizer supplies published in the November, 1952 FARM CHEMICALS, *page 15.*

It brings up to date a PMA forecast on fertilizer supplies made last October, and included in the November, 1952 FARM CHEMICALS.

Revised estimate of the quantity of the three primary plant nutrients for the period is 5.815 million tons, an increase of approximately 11 per cent over the 1951-52 total of 5.245 million tons.

Following are revised estimates for NPK materials with a comparison of some key figures against the earlier PMA estimates:

NITROGEN—Revised estimate is 1.660 million tons, an increase of 4.7 per cent over the earlier estimate and 16.5 per cent more than the 1951-52 supply. Most figures are close to the earlier estimates with these exceptions: Total supplies of ammonium sulfate are now listed as 382,000 tons, compared with 316,000 and NH_3 for ammoniation dropped from 37,000 to 25,000.

PHOSPHATES—Revised estimated supply is 2.410 million tons, a 2.2 per cent decrease from the 1952 estimate but almost eight per cent above the 1951-52 supply. Normal and concentrated superphosphate were revised downward from 1,723,000 and 499,000 tons to 1,712,000 and 467,000 tons respectively.

POTASH—Revised estimated supply is 1.745 million tons, a drop from the earlier forecast but approximately 10 per cent more than the 1951-52 supply. Notable changes include a drop in muriate of potash from 1,698,000 tons to 1,585,000 tons and a rise in the miscellaneous and byproduct materials category from 38,000 to 43,000 tons. ◆

Table 2. Distribution of Fertilizers for Years 1943-1952 and Per Cent of Change, By Regions[1]

Regions	Years Ended June 30									
	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952
New England										
Consumption-tons	490,411	492,635	493,262	521,288	505,814	535,150	521,255	505,398	456,667	487,915[3]
Percent of Change		0.45	0.13	5.68	-2.97[2]	5.80	-2.60	-3.04	-9.64	6.84
Middle Atlantic										
Consumption-tons	1,454,738	1,547,872	1,622,279	1,680,917	1,776,909	1,796,636	1,856,029	1,893,721	1,956,283	2,037,560[3]
Percent of Change		6.40	4.81	3.61	5.71	1.11	3.31	2.03	3.30	4.15
South Atlantic										
Consumption-tons	4,434,917	4,678,417	4,652,639	5,014,148	5,473,540	5,245,287	5,536,475	5,409,171	6,004,426	6,210,873
Percent of Change		5.49	-0.55	7.77	9.16	-4.17	5.55	-2.30	11.00	3.44
East North Central										
Consumption-tons	1,643,853	1,782,407	2,176,288	2,615,956	3,159,354	3,500,319	3,594,685	3,434,174	3,979,359	4,551,240
Percent of Change		8.43	22.10	20.20	20.77	10.79	2.70	-4.47	15.88	14.37
West North Central										
Consumption-tons	309,814	356,931	462,265	635,630	770,257	1,027,931	1,190,550	1,186,416	1,500,798	1,747,692
Percent of Change		15.21	29.51	37.50	21.18	33.45	15.82	-0.35	26.50	16.45
East South Central										
Consumption-tons	1,932,091	1,880,175	1,968,975	2,213,183	2,265,447	2,775,680	2,941,814	2,840,808	3,206,314	3,380,136
Percent of Change		-2.69	4.72	12.40	2.36	22.52	5.98	-3.43	12.87	5.42
West South Central										
Consumption-tons	546,606	631,423	619,810	789,047	935,365	1,032,880	1,148,466	1,288,031	1,463,858	1,471,753
Percent of Change		15.52	-1.84	27.30	18.54	10.42	11.19	12.15	13.65	0.54
Mountain										
Consumption-tons	48,384	95,371	135,830	143,510	196,527	221,998	183,761	205,369	280,878	315,956[3]
Percent of Change		97.11	42.42	5.65	36.94	12.96	-17.22	11.76	36.77	12.49
Pacific										
Consumption-tons	445,131	605,575	1,070,106	1,190,275	1,423,464	1,334,333	1,227,852	1,214,644	1,659,337	1,839,057
Percent of Change		36.04	76.71	11.23	19.59	-6.26	-7.98	-1.08	36.62	10.83
Continental U. S.										
Consumption-tons	11,305,945	12,070,806	13,201,454	14,803,954	16,506,677	17,470,214	18,200,887	17,977,632	20,507,920	22,042,182[3]
Percent of Change		6.76	9.37	12.14	11.50	5.84	4.18	-1.23	14.07	7.48
Territories										
Consumption-tons	159,383	288,464	264,700	323,725	331,975	348,187	340,998	365,668	480,820	380,221
Percent of Change		80.99	-8.24	22.30	2.55	4.88	-2.06	7.23	31.49	-20.92
United States and Territories										
Consumption-tons	11,465,328	12,359,270	13,466,154	15,127,679	16,838,652	17,818,401	18,541,885	18,343,300	20,988,740	22,422,403[3]
Percent of Change		7.80	8.96	12.34	11.31	5.82	4.06	-1.07	14.42	6.83

1/ Includes: Ground phosphate rock, basic slag, dried or processed manures but not unmanipulated manures, sewage sludges, minor and secondary element materials, and fertilizers distributed by Government agencies. Excludes materials used in the manufacture of commercial mixtures and liming materials but includes gypsum distributed by manufacturers of fertilizers. 2/ Minus sign denotes a decrease. 3/ Preliminary.

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Testing farm chemicals is a continuing process at Ethyl. Here James McCoy works on a chemical project in the Detroit research labs of Ethyl Corporation.

Ethyl Corporation becomes the fourth and the biggest lindane producer.

Ethyl Makes Lindane

CONSTRUCTION of a lindane plant that will give Ethyl Corporation the largest capacity for producing that pesticide, is being rushed by the corporation to meet the needs of the 1953 growing season.

The plant, nearing completion at Ethyl's Baton Rouge, La., site, represents a major step toward realization of the USDA goal of 5.1 million pounds a year of the potent insecticide.

Along with its entrance into the lindane field, Ethyl is expanding its facilities for producing 2, 4–5 T, using waste isomers from lindane.

Available at Low Cost

Ethyl, famous for tetraethyl lead and related products, will be marketing both lindane and high gamma BHC this year.

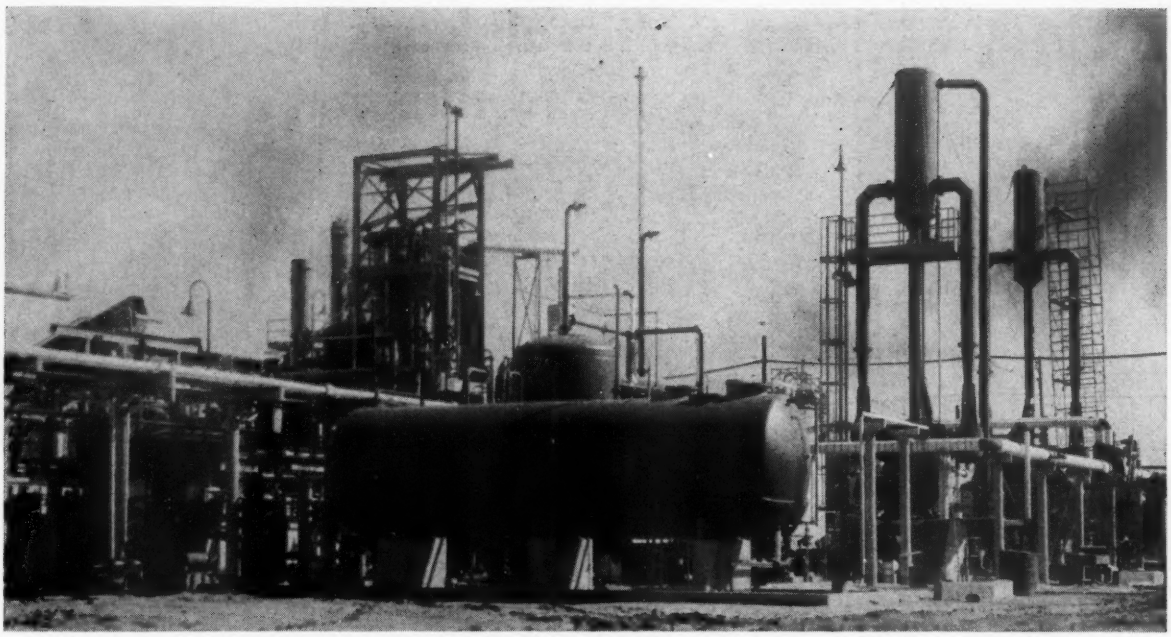
The company's announced objective in entering the lindane field is to make the insecticide available to farmers at low cost by means of large-scale production. Current price of lindane is around $3 a pound. Technical grade BHC sells roughly at 14 cents to 18 cents a pound.

Only other manufacturers of lindane in the United States are Hooker Electro Chemical Company, Diamond Alkali Company and Tennessee Products and Chemical Corp.

Lindane and BHC aren't the only farm chemicals occupying the attention of the organization's research and development section, formed in 1949.

Dr. Charles L. Smith, associate director of product development in charge of agriculture chemicals, recently outlined other activities of his section to FARM CHEMICALS

Dr. Smith, who came to Ethyl in 1949 from the National Agricultural Chemicals Association, said the



General view of Ethyl's BHC facilities in Baton Rouge, La. Adjacent is the corporation's new lindane plant.

company is working with Boyce Thompson Institute, at Yonkers, N. Y. in the development of other pesticide materials.

"Interesting Possibilities"

"One of the materials recently announced," said Dr. Smith, "has interesting possibilities." The material has the technical name alpha-cyano- beta- (2,4-dichlorophenyl acrylic acid).

It has been tested in greenhouse experiments on tomato and marigold plants. When applied at low concentrations, research has shown, the material has inhibited the growth of the plants. More than 75 experimental station personnel are testing Ethyl 214.

Moreover, extensive field and development work is going forward on fungicides, defoliants, and herbicides, with more than a score of experiment stations cooperating in various phases of the program.

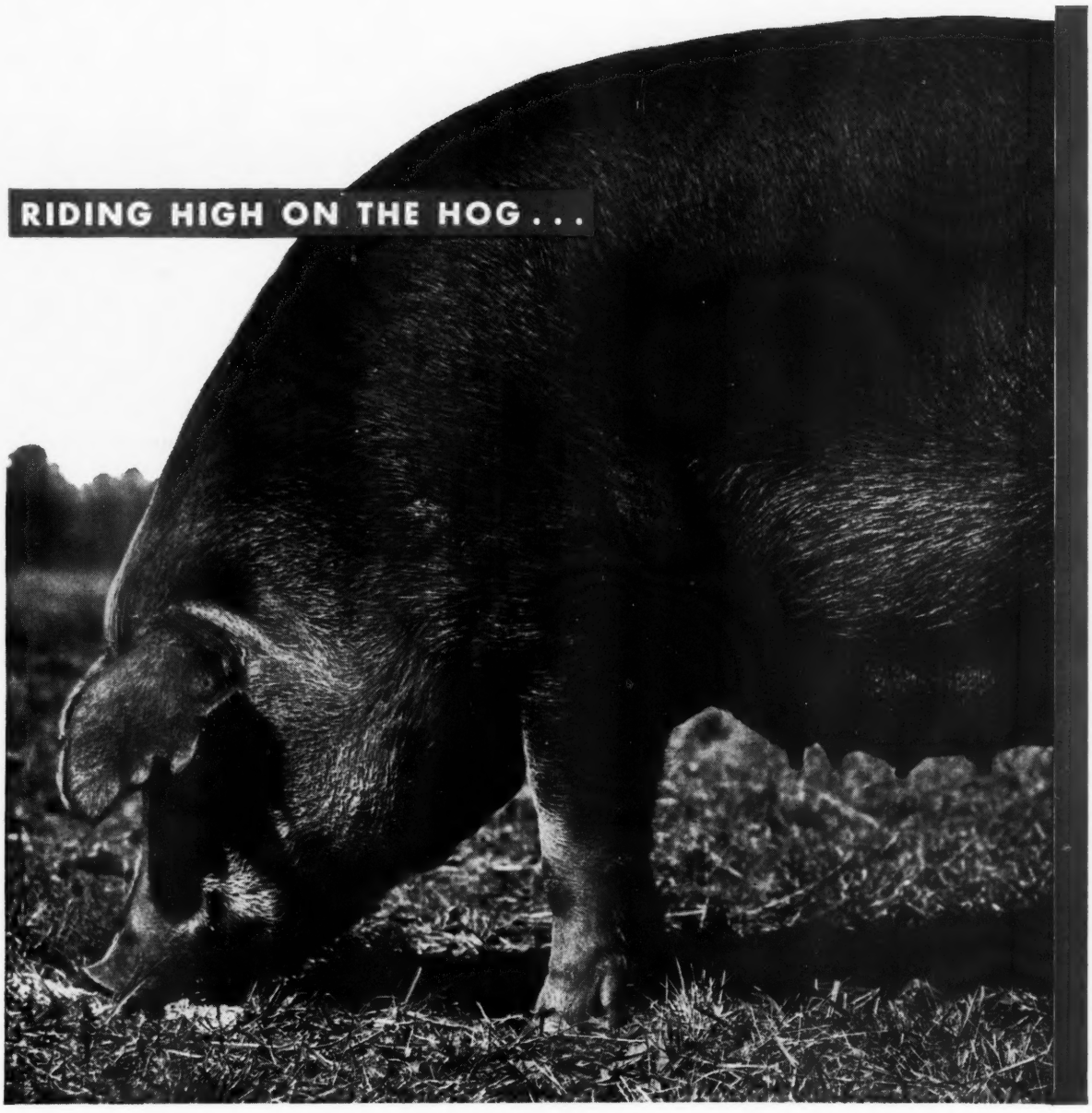
Ethyl's entrance into agricultural chemicals, Dr. Smith explained, was originally an outgrowth of its long experience in producing chlorinated compounds. Since then, however, the Corporation has embarked upon an extensive research and development program, aimed at developing new useful chemicals for the American farmer.

Today, the company conducts a coordinated research program which includes the facilities of its central research laboratories in Detroit, the Boyce Thompson Institute for Plant Research in Yonkers, N. Y., and the company's product development staff in New York City. Ethyl's staff of entomologists, physiologists and plant pathologists is evaluating new chemicals produced in its research laboratories, investigating the need for other chemicals and developing improved formulations of agricultural chemicals presently in use. The company is sponsoring a research project at the Boyce Thompson Institute as part of its over-all program.

As in the case with BHC, Ethyl will manufacture lindane in technical grades for use by farm chemical manufacturers.

For further information on Ethyl lindane fill out a Reader Service card, using **Code Number 4-5.** ◆

Research workers at Boyce Thompson Institute test chemicals for Ethyl.



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GRANULAR MURIATE OF POTASH 48/52% K_2O
MANURE SALTS 20% K_2O MIN.

is the promise of food for millions and a fair profit for the farmer. From shoat to slaughterhouse, hogs are fattened with prime feeds to produce top quality pork. The farmer uses his knowledge, the soil its strength, to put meat on the tables of the families of the world.

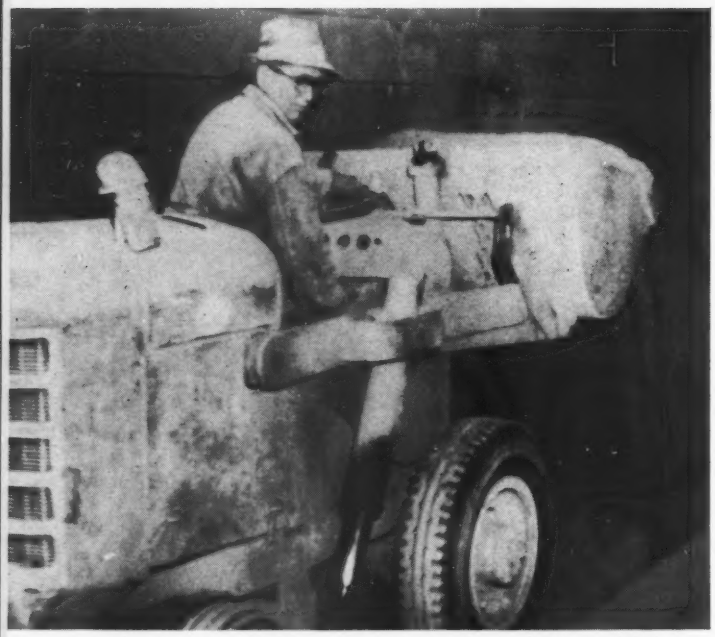
As the work of the farmer is repaid in profits, so must the efforts of the soil be repaid. For, from the soil comes strength for growing crops, the vital plant-food elements that nourish all life. And to the soil these elements must be restored.

Many of the most effective fertilizers contain POTASH, often Sunshine State Potash, a product of New Mexico. Potash adds vital food elements to the soil and helps strengthen crop resistance to drought and disease. Widely used, POTASH proves a valuable aid in producing bigger profits, proves a good business investment.

UNITED STATES POTASH COMPANY, Incorporated, 30 Rockefeller Plaza, New York 20, N. Y.

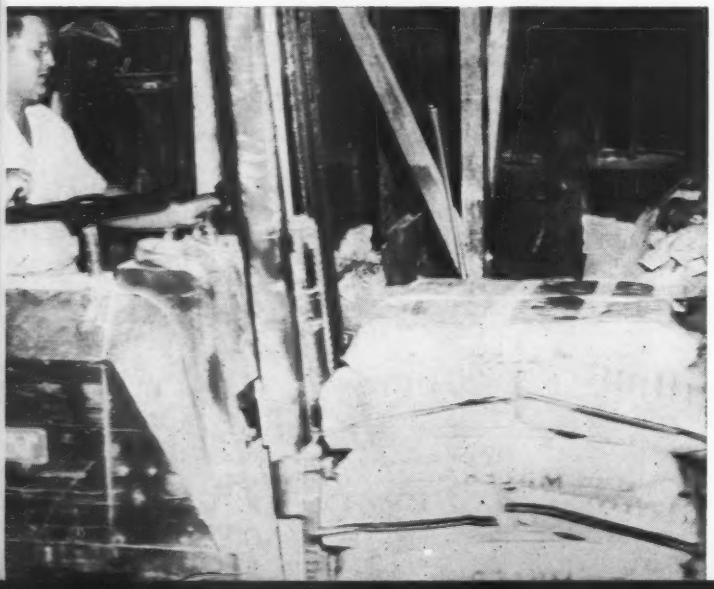
Miller Chemical & Fertilizer plant manager E. W. Moore, left, supervises blending of one of the soluble fertilizers.

Worker adds nitrogen solution to fertilizer at Miller plant.



A small company with modern ideas—that's Miller. Efficient Payloader replaces old fashioned hand pushed carts in the plant.

Another example of progress at the plant is the use of Towmotor lift trucks for moving bagged insecticide mixtures easily.



Miller Chem & Fert is typical farm chemicals company making

Fertilizers and Pesticides for a Balanced Operation

By Hamilton C. Carson
Managing Editor

MANY a fertilizer manufacturer must sometimes wonder why he ever got into the business when he is alternately confronted by these headaches:

1. The necessity of producing tremendous quantities of plant foods, packaging them and shipping them to distributors or farmers in a short period of time so they are ready for application when the farmer needs them.

2. The barren post-season months of the year when fertilizer sales have ebbed to the point where workers must be laid off, machinery is idled and income drops rapidly.

There have been two prominent answers to this seasonal aspect of the fertilizer business.

First has been the long slow process of educating farmers to buy plant foods early—to take fertilizer inventories from the factory and put them on the

farm. Such a move naturally benefits the producer as well as the farmer.

But the farmer being a notoriously independent sort, not much success has resulted from these educational attempts (although the recently inaugurated USDA-Land Grant College Program may help out the cause).

That's why many manufacturers who formerly confined their manufacturing to fertilizer have turned to diversification of products to keep their plants humming all year long.

Such a situation faced the founders of Miller Chemical & Fertilizer back in the late thirties when they contemplated an entrance into the fertilizer industry.

Miller made the wise decision of combining manufacture of pesticides with fertilizers to give the company the diversification necessary for balanced operations.

An Industry-Wide Problem

"The problem of some additional line of business—beyond fertilizer—is one that concerns many fertilizer manufacturers," W. Newton Long, president of Miller, told FARM CHEMICALS in describing how his company got underway in the industry in 1937.

Long said Miller, at the inception of its business, decided upon insecticides and other pesticides for these reasons:

"First and most impelling was the fact several of those starting the business also were familiar with the line, so the addition was not too difficult.

"As is true with most business problems, Miller has found both advantages and disadvantages in this endeavor.

"On the positive side may be mentioned that many customers purchase both fertilizers and insecticides. So the same salesman can offer both lines and many overhead items are not greatly increased.

"On the negative side is the requirement of a sales force better trained technically than is necessary for fertilizer sales. Also necessary are trained entomologists and agricultural chemists. Further, one could wish that the peak of sales of the two lines would come at different periods in the year. The fact is that both peaks occur during spring and early summer."

It was with this philosophy toward production that Miller Chemical & Fertilizer Corp. was organized 16 years ago by several men who had served formerly with Davison Chemical Co. in Baltimore.

"Small, Closely Owned"

Miller, also located in Baltimore, is described by its president as "one of the small, closely owned companies supplying fertilizer and insecticides to the farmers on the eastern seaboard."

Long had been in the sales department of Davison for several years before forming the new company.

Otto Neuman Jr., a vice president of the firm, had served in the sales department of Miller Fertilizer Co., a subsidiary of Davison.

Miller, at its beginning, was small. The company consisted only of a small fertilizer dry mixing plant on the waterfront in Baltimore. But growth was rapid.

A larger fertilizer plant was built at Whiteford, Harford County, Md., several years later. A third mixing plant was built in the forties at Hanover, Pa.

Packaging parathion powder requires utmost precautions. Note use of respirators, gloves, hood.

With the three plants Miller boasts that it is supplying thousands of farmers with their fertilizer needs. Each of the plants is equipped with valve bag packing machines, equipment to use liquid nitrogen solutions and Hough Payloaders to reduce manual labor.

Large Insecticide Plant

The pesticide side of the business also has received close attention by company officials. They have a large insecticide plant in the home city of the company where insecticides and fungicides are compounded and packed.

A modern insecticide dust blending plant is maintained at Salisbury, Md., and a lime sulfur solution plant is operated at Whiteford, Md.

Keeping up with the rapidly progressing pesticide industry is no easy matter, as President Long well knows. To use his words "The insecticide business is one that requires constant vigilance—even more exacting than the fertilizer line.

"It seems new insects appear every year and new remedies are recommended both for the new pests and the old ones. Then too, the highly toxic insecticides require the utmost precaution, both in the plant and with the user in the field."

Precautions With Parathion

In the handling of parathion, a big product at Miller, special precautions are taken. Rooms in which formulations of the highly toxic insecticide are prepared are separated from the remainder of the plant, and are under forced ventilation.

Workers use gas masks and rubber gloves to protect themselves from the material. In addition

(Continued on page 72)

Attention manufacturers!
Here are some points on

PESTICIDES: Development, Marketing

THE introduction of new pesticides for use on food crops and livestock is a matter of public concern. So many new chemicals have been discovered for controlling insects, plant disease agents and weeds that farm operations are being drastically changed.

All available evidence indicates that even more new chemicals can be expected during the next few years. Sound policies must be observed in their evaluation and introduction.

These new materials would not be introduced and could not survive if they did not serve a useful purpose and improve our food supply. Because they are needed, every effort should be made to encourage the research necessary for their development and to assure their use as soon as they can be introduced without jeopardizing the food supply or the health of the consumer.

Varied Properties

Because of the wide variability in the chemical and physical properties of these materials the crops on which they are to be used and their response to climatic conditions each chemical presents problems peculiar to itself.

However, studies made by the Food Protection Committee during the past year have revealed many basic considerations in which there is general agreement among government agencies, industrial concerns, agricultural scientists and food technologists regarding evaluation and testing of pesticides prior to commercial use. Some of these basic principles are summarized in this report.

FARM CHEMICALS *presents herewith the first portion of a report by the subcommittee on pesticides of the Food Protection Committee, National Research Council. Dr. George C. Decker, chairman of the subcommittee, released the report. It was distributed by the National Agricultural Chemicals Association. Concluding portion next month.*

Decker

A primary objective of American agriculture is to provide an abundant supply of nutritious, wholesome food. Through war and peace this objective has been attained, with reasonable surplus to help less fortunate neighbors of the world through their major food crises. The bounty of our farms has become so legendary that many people have come to believe that we have an inexhaustible supply of foodstuffs. Unfortunately, this is not true.

Food Requirements

The food requirements of the past 35 years have been met at the price of drastically lowered soil fertility and the ruination of about three-quarters of a million acres by soil erosion. Meanwhile our population has been increasing at the rate of about 6,000 persons a day.

The increase during the period 1940–1950 was the largest of any decade in our history. The food requirement of the United States is estimated at approximately 18 per cent more for 1960 than it is today. It is possible that American agriculture could, without the use of pesticides, produce sufficient food to provide a minimum calorie diet for our population.

But without pesticides, most fruits and vegetables cannot be produced in the variety and quantity required to supply an adequate diet of protective foods.

In view of these facts, efforts to improve the efficiency of food production must include the suppression of insects and plant diseases which now destroy 15–20 per cent of our crops. We need better chemicals to reduce such depredations, particularly in those cases where pests are becoming more resistant to the commonly used pesticides.

For example, there is ample evidence that the codling moth on apples became resistant to lead arsenate so that extra heavy spray applications had to be used. Also, some insects have shown increased resistance to DDT within the comparatively few years that it has been used extensively.

There are two national laws designed to protect our food supply —protect it from loss in produc-

tivity and from being a hazard to the health of the consumer.

The **Federal Food, Drug and Cosmetic Act of 1938** specifies that chemicals may be added to foodstuffs only if they are non-poisonous, or necessary for food production. If toxic materials are indispensable they are to be permitted only at such concentrations as will present no hazard to the consumer.

The **Federal Insecticide, Fungicide and Rodenticide Act of 1947** provides that no material shall be registered for sale in interstate commerce until complete specifications have been filed and data presented to establish its usefulness for the purposes claimed and its safety when used as prescribed.

Government Agencies

The government regulatory agencies do not certify the usefulness of a material or provide data to the public on the comparative performance of different substances beyond assuring themselves that they will be reasonably effective and safe to use. The forces of competitive enterprise regulate prices, extent of use and general acceptability.

The manufacturer of a new chemical and the appropriate government regulatory agencies must assume certain responsibilities to the public when pesticides are placed in commercial use. Government must protect the public from fraud and safeguard public health and it has a moral and legal responsibility to establish and enforce tolerances for materials on food crops which may present a hazard to the public.

In addition to his responsibility with respect to public health, the manufacturer must assume the usual responsibility for performance of the product as claimed and within this responsibility should be granted a reasonable degree of freedom to incur well calculated risks pertaining to crop damage and performance of the material as a pesticide.

Before any new pesticide is marketed, its performance and safety, when used in the proposed manner for the specified purpose, should be clearly established. The chemical and physical properties and the function of the proposed pesticide, its toxicology, both acute and chronic and time and method of application will determine the amount of information required to establish adequately its performance and relative safety.

Data on important points should be of such nature and magnitude as to be reasonably conclusive and/or to permit statistical evaluation.

The following proposals are presented as both practical and adequate requirements for the premarketing evaluation of a new agricultural pesticide. Many chemicals may have very restricted uses or for other reasons may not necessitate or warrant conformance to all categories listed and, therefore, requirements should be properly restricted in accordance with proposed end uses.

Proposed Evaluation

I. Data on Chemical and Physical Characteristics of Pesticide.

The following information should be as complete as possible; however, it is recognized that in some cases it may not be feasible to supply all of the information requested.

A. Chemical name (including abbreviations, trade names, other synonyms) and structural formula.

B. Degree of purity of the pesticidal chemical product, with statement of any materials other than the principal active ingredients known to be present in the commercial grade material.

C. Physical and chemical properties which may limit use or acceptability (include here flash point, freezing point, flammability, taste, odor, color etc.)

D. Solubility in water and other selected solvents.

E. Melting and/or boiling point.

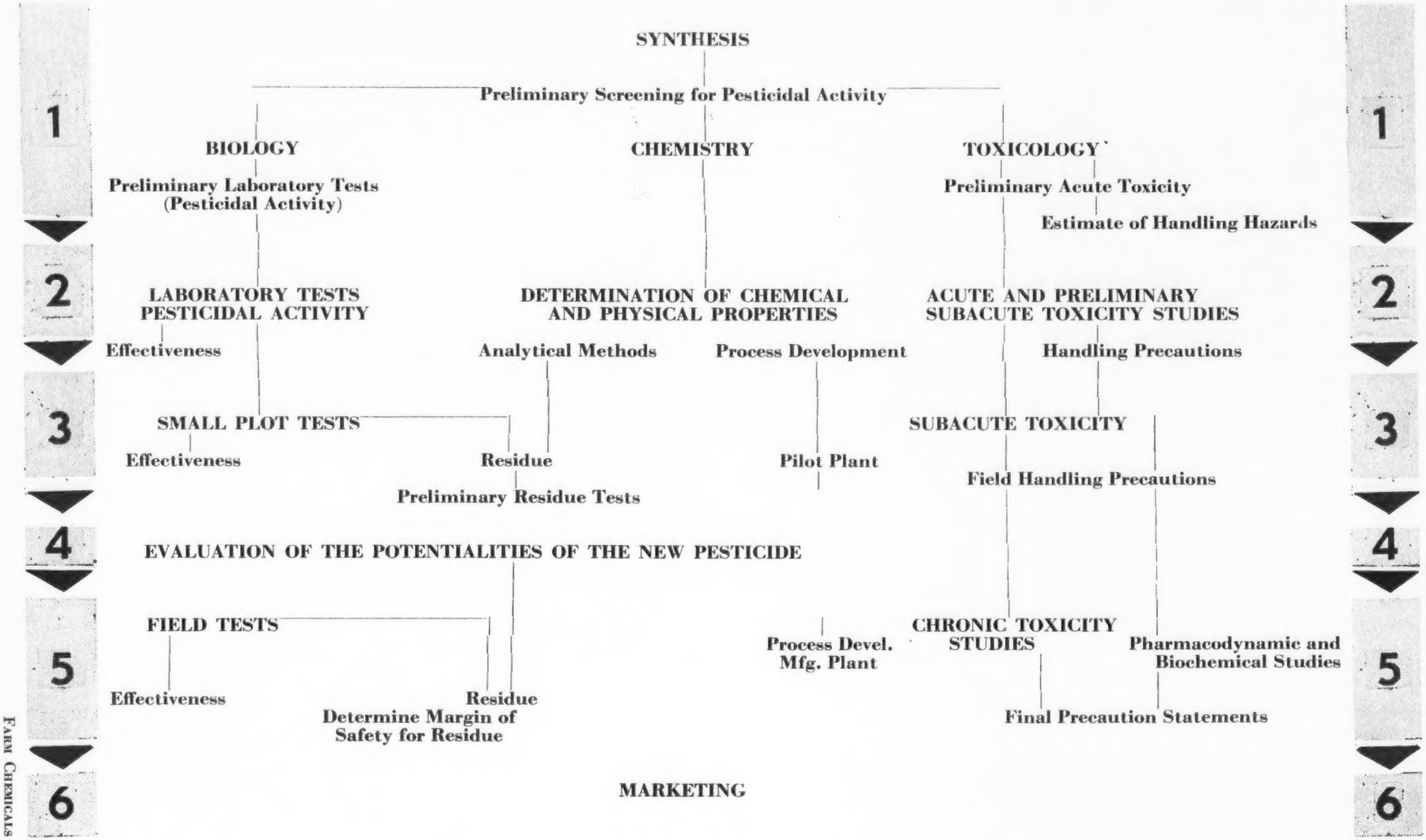
F. Vapor pressure at 25°C. and over the temperature range of use of the pesticide if such data are pertinent.

G. Other physical and chemical identifying characteristics, such as density or specific gravity, refractive index, spectra, etc. These secondary characteristics are especially necessary if the pesticide is not a pure chemical compound.

H. Stability and reactivity (include here information on speed of decomposition before and after application, compatibility with other pesticides and other reactions of interest to the user,

Testing, testing, testing, that's the rule in the development of pesticides. Here USDA entomologist W. A. Gersdorff compares the killing power of allethrin and natural pyrethrum against flies in typical research.

Stages in Development of New Pesticide



such as corrosion of equipment, reaction with hard water, etc.)

I. Analytical methods for macro and micro quantities of the active ingredients, including methods of extraction from plant and animal tissues.

II. Biological or Use Data Requirements

A. Necessity or Justification for Use

To cover the wide variation in conditions that prevail, a general overall set of criteria, as outlined in the categories listed below, is necessary to establish pesticidal effectiveness, which in most cases will constitute the justification for use. However, the emphasis to be placed upon any single criterion will depend upon the nature of the pesticide under consideration.

1. Criteria: Pesticidal effectiveness should be established in terms of percentage or control of pests, increase in yield or quality of crop or other economic gain or practical benefit following application of the specified pesticide under the conditions prescribed, compared with results from standard treatments and/or untreated controls. Examples of other economic gain or practical benefit would include: economy or ease of production, harvest, or storage of the crop; flexibility as regards time of planting or harvest, even at the possible sacrifice of yield and general benefit to livestock, plants or human welfare not necessarily related to yield.

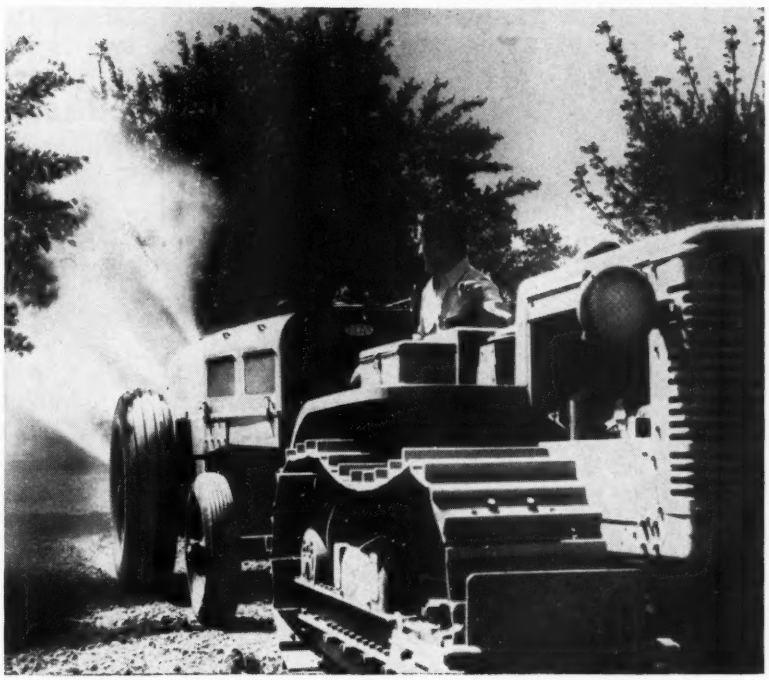
Supplemental information accompanying experimental data should provide a comprehensive description of the material and its use and should include the following information where applicable:

a. Name and percentages of active ingredients and such additional information as is necessary for proper evaluation for ultimate commercial use. The public declaration of so-called "trade secrets" as to methods of formulation of minor adjuvant ingredients should not be considered essential.

b. Rate of dilution for use, if any.

c. Rates of application (per acre, per animal, etc.).

d. Methods of application.



Large scale field tests are the proof of the pesticide. Photo shows Nick Lazaneo, foreman of Du Pont's research farm at Cupertino, Cal., watches spray pattern of newly developed insecticide on prune trees.

e. Pests controlled, prevented or repelled, or other benefits.

f. Dates of treatment and dates when results were taken.

g. Description and identity of plants or animals treated, together with a statement of their approximate development, age or size when tests were started and when completed.

h. Identity of application areas and description thereof if neither food plants nor animals are being treated, (barns, ornamental, etc.).

i. Geographical site of the tests.

j. Identity of persons and organizations conducting the tests.

k. Results in detail, with information as to the immediate and delayed effects and pertinent data on environmental conditions prevailing during the test period.

2. Experimental Data

a. Laboratory Tests. The results of laboratory tests for the evaluation of the product against the pest in question and related species should be made available. Considerable weight should be placed on such tests, from the standpoint of the measurements of pest response.

Characteristics of the product and its proposed action or use will largely determine the suitability of such data as a principal basis for evaluations.

b. Small Plot Tests. The amount of data obtained in small plot tests should be adequate to demonstrate proper performance under natural conditions. The proposed end use, the nature of the pesticide, the method of application and the amount and consistency of the data will determine the weight to be given such evidence in the evaluation of a product. Data covering specified uses should be based on tests conducted for at least one growing season under environmental conditions similar to those prevailing in the area where use of the material is proposed.

c. Large Scale Field Tests should be made on farms using commercial type of equipment under farm conditions. The data obtained in such tests are considered the most reliable indications of how the material may be expected to perform in regular use. However, the information desired here may be considered as partly interchangeable with that obtained under the heading "Small Plot Tests." Laboratory and small scale field

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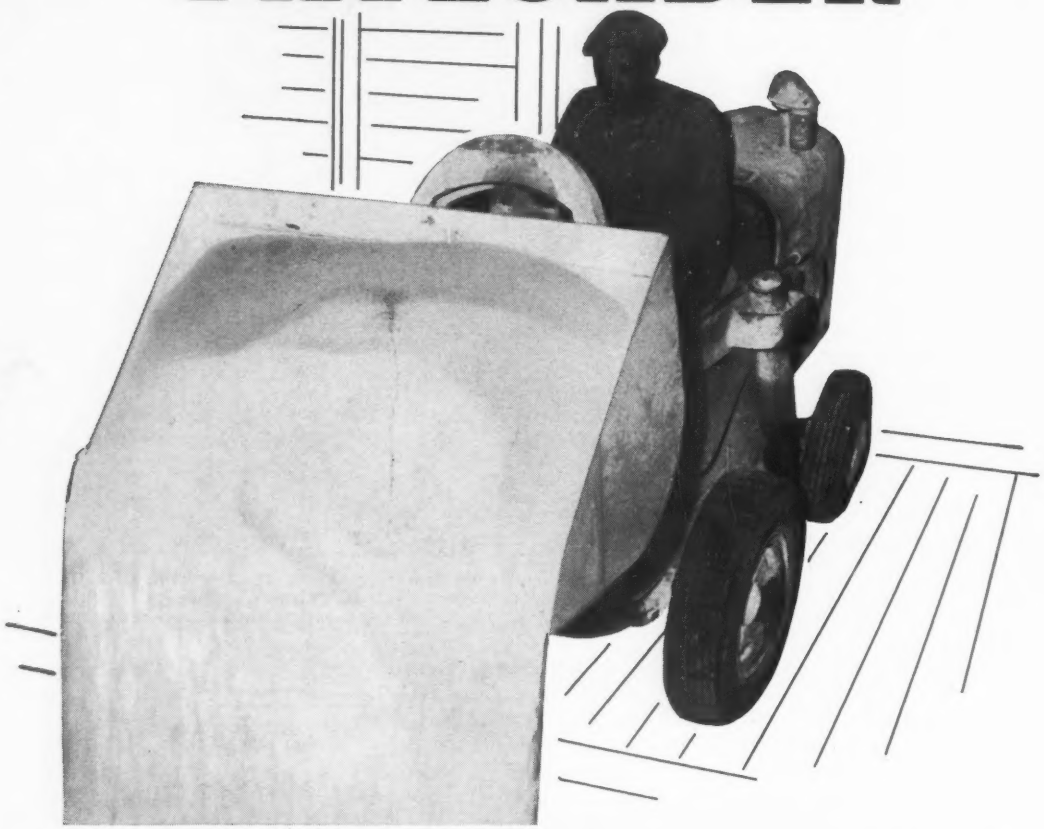

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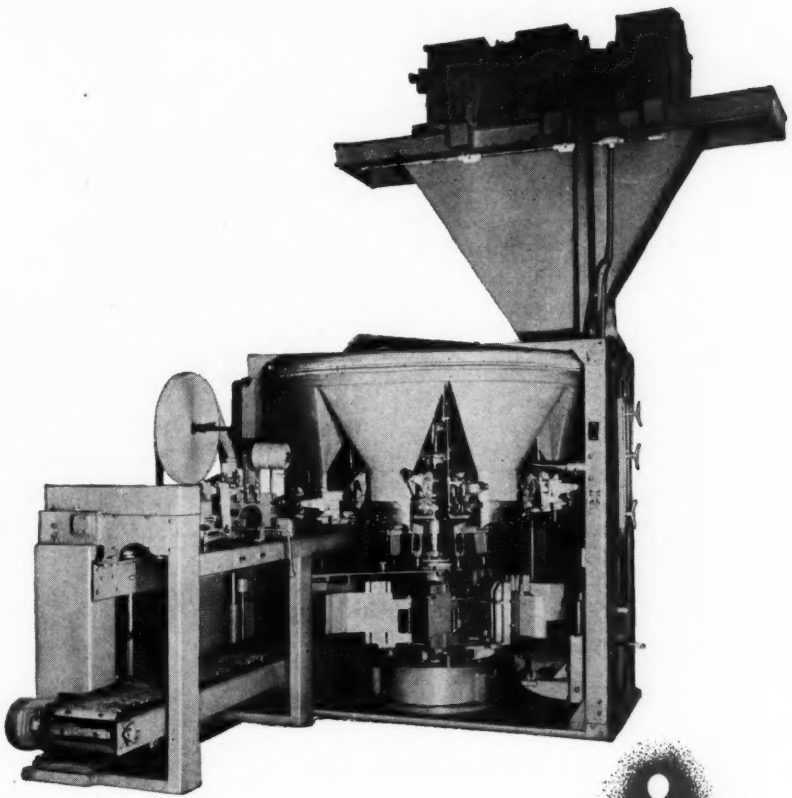

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tests may be used interchangeably with or as a supplement to field test data, depending upon extenuating circumstances and conditions.

B. Safety on Plants and Animals

1. Plants. Data should be collected as to plant injury, if any, in connection with the performance tests. Careful notation should be made of the type of injury, if any, such as stunting, reduced yield, leaf drop, tip burn, spotting of the leaves, etc. Where plant injury seems probable appropriate warnings should be made available.

2. Animals. Similar data should be obtained as to irritability, etc. where the pesticide is proposed for use on animals.

C. Compatibility. Compatibility data should be supplied where the product is suggested by the manufacturer for use with another pesticide or additive. Data on compatibility with other materials are desirable but should not be considered necessary unless such materials would obviously be used in the same spray schedule in accordance with recognized practices.

D. Reduction in Quality of Food, Including Adverse Appearance, Flavor or Taste. In connection with the performance tests, observations should be made for any departure from the normal in the flavor or appearance which may affect the salability of the food items.

E. Accumulation in Soils (Soil Residues). Observations should be made as a part of the performance tests to determine whether the pesticide is stable or unstable and transitory in soils. Observations from laboratory, greenhouse or small plot tests generally will be satisfactory.

F. Residues. Data should be obtained on the amount of residue remaining on or in foods at harvest under the proposed method of treatment. The amount of such data required will depend upon (1) the recommended purpose, dosage and time of application of the pesticide, (2) the acute and chronic toxicity of the chemical, (3) its physical and chemical properties and (4) its rate of disappearance.

Where pesticide residues may be anticipated on or in the food product, forage, or animal product, at the time of harvest or slaughter, data establishing the residue remaining after effective dosages under optimum conditions for retention over the maximum time period of application should be considered essential. These data, which may be obtained from representative material employed in the tests on pesticidal effectiveness, should show the total amount of chemical found on and/or in a stated weight of the food product.

Less residue data would be required for pesticides which have no toxicity to warm-blooded animals at recommended dosages, are highly volatile or otherwise non-residual, or are decomposed to non-toxic components before harvest.

If a potential hazard is disclosed by the preliminary data on the amount of residue or toxicity potential of the compound, more extensive data on the magnitude of residues remaining at harvest on representative food crops produced under representative environmental conditions should be obtained.

Bioassay methods of demonstrated reliability may be used in lieu of chemical residue determinations where satisfactory chemical methods have not been developed.

If excessive residues are detected, methods for their removal should be developed.

G. Operational Hazards. Where necessary, proper precautionary procedures relative to handling and use should be developed.

III. Toxicological Data Requirements.

A. Safety or Hazards of Use. Many of the pesticides, particularly insecticides are known to be toxic. Data are needed to provide for—first, a clear delineation of the toxicity of the compound, as regards both qualitative and quantitative factors; second, an assessment of the hazard to consumers created by use of the compound to meet specific pesticidal needs and third, an estimate of the hazard to those who must handle the material in manufacturing, formulation, crop testing and application.

It should be noted that no available technic is capable of giving absolute assurance that a food or water containing a pesticide is completely safe to all humans under all conditions. Thus it is possible to determine beyond reasonable doubt the harmlessness of a given chemical additive in food or water, but to prove its absolute safety is impossible.

B. Determination of Toxicity. Toxicity must be established in terms of generally accepted indices of injury, such as structural, biochemical, or physiological changes in specific organs or body systems.

No single rigid program can be laid down which will apply in relation to every new pesticide in all its possible applications. Data developed in one phase of an investigation may serve to show either that experiments included in original plans are superfluous or, on the other hand, that original plans must be expanded to elucidate more fully some critical findings.

For determining the advisability of program curtailment or expansion at any given point, on the basis of toxicological findings, only one rule can be laid down—such decisions must be made on the basis of the facts in the immediate situation by toxicologists qualified by scientific training and experience to assess cuch situations.

It is obvious that use data or other non-toxicological factors also operate in instances to influence the scope of the toxicological program. Evidence of a broad field of usefulness against many crop pests might dictate a more extensive program than originally contemplated, while failure of the compound in small plot tests would almost lead to its discard.

Concluded Next Month

A familiar sight anywhere along the coast of the English Channel Island of Jersey in the late summer and through the winter is the collecting of vraic or seaweed. It is used for fertilizer on the island farms.

Farmers on channel islands make fertilizer from seaweed

'Father Neptune's Compost'

By S. Jepson

of Isle of Jersey
Fellow of Institute of Journalists

WHEN it was decided to strike a special postage stamp in commemoration of the liberation from the Germans of the Channel Islands, a cart collecting vraic, or seaweed, was chosen for the picture. It was considered a typical scene for the islands, where farming is nothing if it is not intensive.

Most of the farmers—they call themselves "growers"—in the two main islands of Jersey and Guernsey, have to play the game at 100 cents to the dollar in order to get a return from their holdings.

For these little farms indeed would seem a postage stamp size to the big American rancher or even to the British farmer with his broad acres. Jersey farms are measured in vergees, and a typical holding from which in good years a man may reap a rich profit may be 50 vergees, approximately 22 acres.

Two Crops

Two crops a year are produced,

and as soon as the early potatoes, for which the islands are famous, are lifted, in go the tomatoes, or "toms" as they are called. Both crops take a good deal from the soil, which often is of a light consistency, in some places looking like sand.

Wise old Mother Nature comes to the help of these industrious and often rugged growers. Apart from the very helpful fact that the seasons are a month ahead of those in Great Britain, with mild and genial winters when frost is fairly rare and snow is headline news, the rocky coasts around the islands provide a form of manure which is plentiful and free.

This is what one might call "Father Neptune's Compost," or the long and trailing seaweed which grows around the rocks on the shores.

Coast Always Near

On such small islands the coast is never more than a few miles distant, and seaweed abounds. Another helpful factor is that the tides are among the highest in the world, as holiday excursionists who venture around headlands at low tide may discover.

A height of 39 feet is reached at certain times of the year. Heavy Atlantic gales wrench from the rocks the long and brown glistening seaweed and leave it on a wide stretch of shore. At low tides, on a gently shelving beach like that along the south coast of Jersey, there may be a sand area of almost a mile of depth and several miles width, with the vraic deposited here and there.

Slipways to give approach to the beaches are built of solid Jersey stone here and there which enable farm lorries, or old fashioned vraic carts, to move along the beach. The vraic is piled high and if the driver is not familiar with the beach signs, he may move on to soft sand and get bogged. More than one lorry has been observed trying desperately to extricate itself while the tide rolls remorselessly toward it.

Taken to Farms

Vraic is taken to the farms and can be applied either wet and then plowed in after drying or it may be left in piles to air dry and then mixed with farmyard manure as a sort of dried compost.

Root crops like potatoes and mangolds grown for Jersey cattle are greatly benefited.

Some farmers believe, however, that when the vraic is applied wet the land is kept "cold" for a long period through the winter. The vraic is gathered and applied in the autumn, after the tomatoes are finished, and continuously through the winter until the late spring in some places.

One sees the heavily laden lorries with their wet and glistening loads all over the island in the winter. It is a difficult load to stack on the lorry, and some of it inevitably comes off on to the roads.

High Reputation

The high reputation of seaweed as a manure has been established for many years, and where it is available in quantities with no nearby farming land there would seem to be an opportunity for some enterprising farm to collect and dry the seaweed and sack it for sale. Rocky maritime districts like Cornwall and Devon, as well as the Isle of Thanet long have known the value of seaweed.

An analysis of vraic when it is fresh shows that it is three-quarters water, one-fifth organic matter and one-twentieth mineral matter. Chief value is in the potash, of which a ton of fresh seaweed contains 15 to 20 pounds. In the very useful light soils used for tomatoes it increases the moisture content.

Highest potash content is in the deep-water Laminaria which grows immediately below low-water mark and is popularly known as "drift weed," "tangle" or "kelp." This has broad flat fronds or laminae, which hold the potash. After the autumn storms in Jersey, lorries may be seen from early morning on the beaches gathering this precious kind of vraic. Cut seaweeds of the fucus varieties also are used.

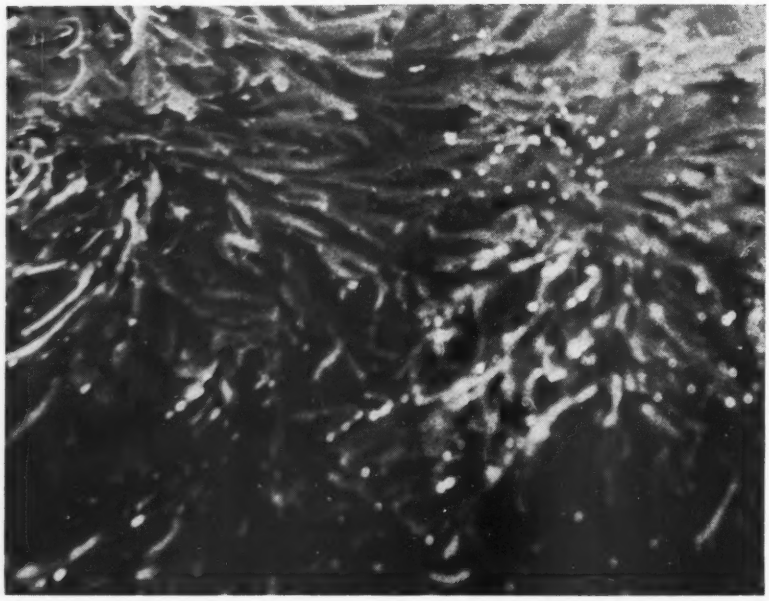
Seaweed Content

Analysis shows that a ton of wet seaweed also contains 10 pounds of nitrogen and the same quantity of phosphoric acid, 50 pounds of salt, and 400 pounds of organic matter.

A well-handled sample of farmyard manure analyses as follows: approximately 11 pounds nitrogen, six pounds phosphoric acid, 15 pounds potash and 380 pounds organic matter a ton.

Local farmers are fully aware that the decay of strawy manure is hastened by being composted with seaweed. They know also the disadvantageous effect of the salt is reduced by applying the

Closeup view of seaweed strewn along the island shore. The material assumes major agricultural importance on the tiny "postage stamp" farms.



How You Can Get

Free Information

On each of the two postage-paid postcards below you can request further information on four items described on this and the Industrial News section of this issue. *Fill out one quarter section for each item in which you are interested.*

4-5 Ethyl Lindane

An excellent illustrated booklet on Ethyl lindane has been prepared by the company to coincide with its entrance into the lindane field. (see page 28) Written primarily for insecticide formulators, the literature describes chemical and physical properties of lindane, outlines its usefulness against insects and describes pesticide formulations using the material. **Code Number 4-5.**

4-6 Story of Phosphorus

A fascinating account of phosphorus, from the mine to scores of finished products is told in a booklet produced by Monsanto Chemical Co. called "Phosphorus, the Light Bearer." The story traces the historical highlights of phosphorus and describes how the mineral was formed thousands of years ago. It follows the chemical production of the many products derived from the element and outlines their uses in industry. **Code Number 4-6.**

4-7 Magnesium Barrel Skid

If loading barrels enters into your materials handling and shipping operations, you may want to consider a new all-magnesium skid for drum and barrel handling. It's described in a booklet from Magline Inc. The skid is of welded construction throughout and combines light weight and ease of handling with rugged strength. **Code Number 4-7.**

4-8 Pesticide Products

A complete list of pesticide products available from the company is contained in a folder issued recently by Pioneer Chemical Associates. Specializing in insecticides and other farm chemicals, the company lists aldrin, chlordane, DDT, dilan, lindane and many other materials, including a big list of herbicides. **Code Number 4-8.**

4-9 Fertilizer Machinery

Davidson-Kennedy fertilizer machinery has been designed to save time,

Use card at right to get information on products and bulletins. For additional requests write FARM CHEMICALS on company stationery, giving appropriate Code Numbers.

4-1 Fertilizer Scale
4-2 Hyster Truck
4-3 Robo-Lift
4-4 One-Man Truck
4-5 Ethyl Lindane
4-6 Story of Phosphorus
4-7 Magnesium Barrel Skid
4-8 Pesticide Products
4-9 Fertilizer Machinery
4-10 Equipment Chart
4-11 Anhydrous Valves
4-12 Polyethylene Bags
4-13 Loading Ramp
4-14 Pittsburgh Parathion
4-15 Calmonite
4-16 Mineralized Fertilizer
4-17 Cattle Sprayer
4-18 Fertilizer Equipment
4-19 DDD Available

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money and manpower in the mixing of fertilizers, a booklet from the company declares. It goes on to describe the machinery and says each machine is designed to perform a specific operation efficiently and economically and is readily adaptable to any size plant. Included in the line are cluster hoppers, automatic solution tanks, shaker screens, elevators and conveyors. **Code Number 4-9.**

4-10 Equipment Chart

A chart describing its complete line of materials handling equipment is available from Kornylak Engineering Corp. Many illustrations are included to highlight the company's line of equipment for bulk handling, storage, conveying and other jobs in the fertilizer or pesticide plant. Company says its chart will be especially useful to purchasing agents and production men. **Code Number 4-10.**

4-11 Anhydrous Valves

If you need valves for anhydrous ammonia you should check the complete technical booklet prepared recently by Henry Valve Co. It describes the company's line of valves for the fertilizer industry and includes also steel fittings for the same field. The products are of special interest because they were prepared especially for the anhydrous field. **Code Number 4-11.**

4-12 Polyethylene Bags

The trend toward use of polyethylene bags in the farm chemicals industry was described in last month's FARM CHEMICALS. Now Plastic Packaging Co. announces a bulletin describing their line of bags and liners. Not only can the material be used for multiwall paper bags, it has application in drums, cartons and small speciality packages as well. **Code Number 4-12.**

4-13 Loading Ramp

Lots of time and money can be saved by fertilizer and pesticide manufacturers in the important job of loading products if a loading ramp is used. A safety ramp, made of light weight magnesium and featuring a positive locking device, is described in literature from Penco Engineering Co. **Code Number 4-13.**

4-14 Pittsburgh Parathion

Ease of handling is just one of many features claimed by Pittsburgh Agricultural Chemical Co. for its Parathion 25 WM. The pesticide material also is easy to mix and apply, and has high effectiveness against more than 20 major insects, including aphid, greenbug, leaf roller and leaf hopper. Company literature describes the parathion material. **Code Number 4-14.**

4-15 Calmonite

Two fertilizers in one—that's what Calmonite is. And H. J. Baker & Bro., in a descriptive booklet tells the advantages of the ammonium nitrate-lime product. It's sized for flow and ease of application. Calmonite contains 20.5 per cent N—10.25 per cent in the nitrate form and 10.25 as ammonia. For a sample and further information use **Code Number 4-15.**

4-16 Mineralized Fertilizer

Tennessee Corp. says it can help fertilizer manufacturers increase their tonnage and profits simply by adding minerals to their mixes. Soluble trace minerals when added to standard plant foods are producing some remarkable results on crops, the company says in descriptive literature on their product. (Almost any combination of mineral mixtures in large and small quantities can be supplied.) **Code Number 4-16.**

4-17 Cattle Sprayer

A unique cattle sprayer that lets the animals spray themselves is billed as a big sales opportunity for pesticide manufacturers using sprays based on U. S. Industrial Chemicals Co.'s Pyrenone. A company bulletin outlines the advantages of Pyrenone sprays and describes their application on the farm. **Code Number 4-17.**

4-18 Fertilizer Equipment

All steel self-contained fertilizer mixing and bagging units are described in literature from Stedman Foundry & Machine Co. The company, founded in 1834, has batch mixers for dry batching, pan mixers for wet mixing, pulverizers, vibrating screens, acid weigh scales and other equipment especially designed for the fertilizer plant. **Code Number 4-18.**

4-19 DDD Available

A reliable new source of the increasingly important organic insecticide DDD (TDE) has been provided for pesticide formulators by General Chemical division with opening of a full-scale plant at Marcus Hook, Pa. Information on the pesticide material, in the technical and dust base forms is available from the company. **Code Number 4-19.**

Reader Service inquiries will be honored up to six months after date of publication of the magazine in which they appear.

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vraic in the autumn when much of it is washed away though the potash removed is retained in the soil. An advantage of seaweed when used for compost is its freedom from weed seeds and disease spores.

Helps other Plants

Vraic also has proved excellent for potash-hungry plants like mangel, sugar beet, clover, pasture and cabbages. Coastal farms often suffer from unduly light and sandy soils. It is here that nature comes to the rescue and deposits on the shore exactly what the plants need!

Overseas farmers would see much to interest them in the Isles of Jersey and Guernsey. In the former and larger island one sees the intensive cultivation of tomatoes outdoors, with the fruit ripening right up to the end of the year.

In Guernsey indoor cultivation under glass has reached a high standard. Many efforts are made to keep up the quality of the crop, there is constant spraying against pests, and the "toms" ripen until late November or early December. Much labor is entailed and Breton laborers come over from France for the season.

The work of tying to canes or to taut wires between end supports is done by contract. Much of the time also is occupied in trimming or "side shooting" as it is called.

Good Seasons

Two or three years ago tomato growers had very good seasons and total exports ran into millions of pounds sterling. Recently competition from the continent and places like the Canary Islands has made itself felt, and the monetary yield has not been so good.

Jersey potato growers stick to one variety. There are farms in Jersey where the International Kidney variety called locally the Jersey Royal, with its long purple shoots, has been grown for generations without deterioration. The seed is saved from year to year by the farmer.

Most farmers keep cows and the bulls are, of course, exported all over the world. This gentle-looking and high yielding cow seems to deteriorate in other countries unless the stock constantly is renewed.

The bulls have been valuable dollar earners in the past few years and very high prices have been gained at auctions attended by breeders from many other countries.

The granite built farmhouses, with their stone courtyards, date back for centuries in some cases and are picturesque spots. ◆

Carting the vraic to the farm—a big job for farmers on the isle of Jersey. The long and trailing seaweed grows along the rocks of the island, providing plentiful natural fertilizer for the local agriculture.

It started in 1867 . . .

Control of Insects Through the Years

By Harold H. Shepard
Office of Materials and Facilities Production and Marketing Administration
U. S. Department of Agriculture

CHEMICAL control of insect pests in the United States has developed for the most part within the relatively short period of 85 years or so. Considering the present high quality of this form of control and the emphasis placed on insecticides by the chemical industry of today, growth in this field has been truly phenomenal.

Interest in insecticides quickened in 1867 when paris green, an arsenical pigment utilized at that time in coloring paint and wallpaper, was found to kill effectively the Colorado potato beetle.

When the pioneer settlers introduced potatoes close to the eastern slope of the Rocky Mountains where this insect is native on the buffalo bur or sand bur, a related plant, the beetle relished and severely damaged this crop. Widespread cultivation of the potato in settled areas provided a ready means for development and spread eastward of damaging populations of the beetles. The losses caused by this insect aroused popular demand for a practical method of control.

Revision of paper presented Sept. 11, 1951 at the Twelfth International Congress of Pure and Applied Chemistry, New York, N. Y.

Harold H. Shepard

Another serious insect pest, which spurred early developments in chemical control of insects is the San Jose scale, brought to California from Japan some time before 1880. Introduced to the East on nursery stock it became a scourge to fruit growers until lime-sulfur washes were found to provide adequate control. Numerous other examples could be cited of insects whose depredations were the direct incentive for the development of insecticides well known today.

Pests Controlled

In passing it may be mentioned that the Colorado potato beetle and the San Jose scale have been reduced generally to the status of minor pests where appropriate chemicals are applied regularly.

With development of commercial agriculture involving extensive areas devoted to single crops, rather ideal conditions are provided for the reproduction in large numbers of the pests of these particular crops, and the need for insecticides has continued to increase.

In contrast, during the earlier history of agriculture in the United States smaller diversified plantings were made by a rural population individually more self-sufficient than today. There was then little need for large scale chemical control of pests.

Annual Losses

Notwithstanding modern methods of insect control, annual losses in the United States from insect damage are believed to amount now to at least four billion dollars. In present efforts to reduce these losses, there are applied in the United States annually insecticides valued at nearly 150 million dollars on the basis of carload price for the technical material.

In the 1950 season, although supplies were short of demand, more insecticides were applied than in any previous year, partly because economic conditions permitted, when advantageous, a considerable expenditure for insecticides (Table 1). In 1951 these chemicals were plentiful and larger quantities were applied although insect infestations were not so serious. With a continuation of reduced infestations in 1952, the use

TABLE 1. DOMESTIC DISAPPEARANCE OF SOME MAJOR INSECTICIDES BY CROP YEARS

Insecticide	1950	1951	1952
	Pounds	Pounds	Pounds
Benzene hexachloride, 12 per cent gamma basis	71,235,000	80,000,000	92,224,000
DDT	57,638,000	72,688,000	70,074,000
Calcium arsenate	38,842,000	39,588,000	4,735,000
Lead arsenate	27,490,000	30,174,000	17,452,000
Pyrethrum flowers	9,371,000	7,076,000	6,648,000
Rotenone-bearing roots	9,846,000	7,027,000	3,520,000

Import data not corrected for exports or producers' stocks.

TABLE 2. CALCIUM ARSENATE PRODUCTION IN RELATION TO REDUCTION OF COTTON CROP DUE TO BOLL WEEVIL DAMAGE

Calendar Year	Per Cent Reduction	Calcium Arsenate Production Pounds
1939	8.7	39,282,000
1940	6.5	41,349,000
1941	15.4	56,136,000
1942	8.0	84,136,000
1943	6.1	74,854,000
1944	3.9	44,350,000
1945	10.2	25,644,000
1946	13.0	35,392,000
1947	7.6	46,946,000
1948	5.0	27,234,000
1949	17.5	16,006,000
1950	22.6	49,474,000
1951	6.7	38,742,000

Reductions over 10 per cent are underlined for emphasis; likewise high annual production figures.

TABLE 3. PRODUCTION OF SOME SYNTHETIC ORGANIC INSECTICIDES

Calendar Year	DDT	Benzene hexachloride
	Pounds	Pounds
1944	9,626,000	.....
1945	33,243,000	.....
1946	45,651,000	.....
1947	49,600,000	8,197,000
1948	20,240,000	18,382,000
1949	39,904,000	27,937,000
1950	78,150,000	76,698,000
1951	106,139,000	116,988,000
1952	98,773,000	.....

TABLE 4. CONSUMPTION OF FIELD-STRENGTH DUSTS AND SPRAYS ON COTTON, EXPRESSED AS DUST EQUIVALENTS[1]

Insecticide Formulation	Consumption by Crop Years 1949[2]	1950	1951
	Pounds	Pounds	Pounds
Calcium arsenate	28,482,000	33,417,000	26,621,000
Toxaphene, 20%	49,792,000	218,592,000	289,495,000
Benzene hexachloride, 3% gamma	79,497,000	180,347,000	210,151,000
Aldrin, 2.5%	1,470,000	65,246,000	88,931,000
Chlordane, 5%	1,300,000	2,077,000	225,000
Dieldrin, 1.5%	0	10,000	6,421,000
Others	93,000	47,316,000	223,550,000
TOTAL	160,634,000	547,005,000	845,394,000

[1] For lack of data, figures for several states are incomplete each year or not broken down as regards the particular insecticide. Unspecified materials are included under "Others."

[2] Includes only insecticides used specifically for boll weevil control.

of insecticides declined and producers were left with inventories larger than in the previous two or three years.

Increase in the use of insecticides generally is a result also of the growing realization of the value of these materials as a form of crop insurance. Even if a good crop sometimes may be obtained without insecticides the use of these materials usually results in a sufficiently higher yield to warrant application when infestations of injurious insects are present.

Cotton, a crop of major importance in the United States, is affected by many kinds of destructive insects, especially by the boll weevil. Certain insecticides when used in cotton-growing areas can be assumed to have been utilized almost entirely in cotton-insect control. No other crop the size of the cotton crop provides an opportunity to develop estimates of insecticide consumption of such accuracy.

For these reasons figures on insecticide utilization by cotton growers are presented here to demonstrate the enormity of insect control operations involving chemicals.

The chief consideration in insect control on cotton, especially in the early years of the successful use of insecticides on that crop, has been the boll weevil. However, certain caterpillars, sucking bugs, plant lice and mites add to control problems.

The Bureau of Agricultural Economics, U. S. Department of Agriculture, has published figures for the years from 1909 to the present showing the estimated reduction from full yield of cotton due to a number of factors including boll weevil infestation (Figure 1). The boll weevil has been estimated to be responsible for approximately 76 per cent of all insect injury to cotton in the Cotton Belt States since 1909.

It reduced cotton yield by over 30 per cent in 1921 and at intervals since then has reduced the yield from 15 to 20 per cent. Average reduction since 1909 has been approximately 10 per cent. Peak years of boll weevil damage have occurred every three to six years since 1916, with an average period between peaks of 4.8 years.

Heavy use of calcium arsenate to control the boll weevil began in 1919 with the sale of about 1,500 tons of the insecticide. This method of weevil control became well established in the following decade but despite its recognized advantages only a small proportion of growers in certain areas used any insecticides at all. By 1950, however, as high as 85 per cent of the cotton acreage in Mississippi, as an example, received some insecticide. In other areas where applications were less general, the advantages

of chemical control as crop insurance often were amply demonstrated by the profits accruing to those growers who applied insecticides.

Calcium Arsenate Used

Until the advent of effective synthetic organic insecticides following World War II calcium arsenate was the mainstay of boll weevil control with production rising to 84 million pounds in 1942 (Table 2). It is of interest to note that years of heaviest calcium arsenate production lag a year or so behind the seasons of greatest boll weevil damage.

This is partly caused by the greater demand for insecticides the next year or two after growers have experienced heavy damage to their crops.

Since World War II commercial development for agricultural uses of such synthetic insecticides as DDT (in 1946), benzene hexachloride (in 1947), toxaphene (in 1947), aldrin (in 1950), and dieldrin (in 1951) has revolutionized the control of cotton insects (Table 3).

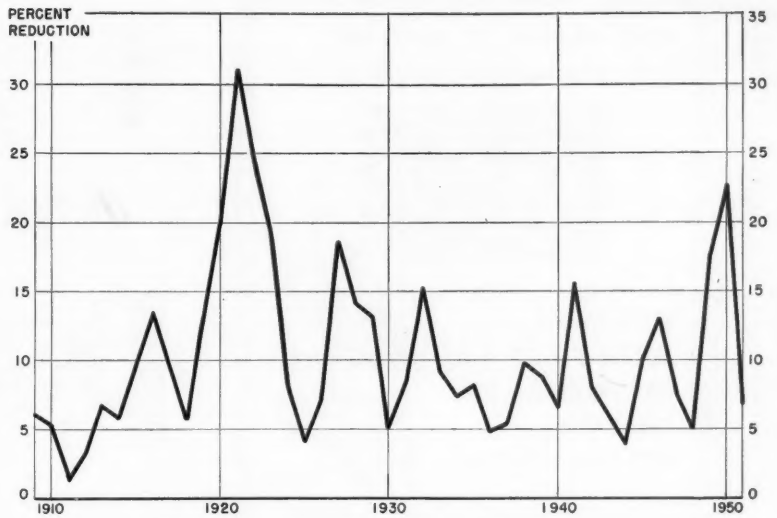
Growers became less dependent upon the single important cotton insecticide, calcium arsenate, and the control of numerous destructive pests of cotton not heretofore controllable was made possible.

Insofar as records are available, calcium arsenate production in 1949 was lower than for any year since 1925. On the other hand it is remarkable that in the crop year from Oct. 1, 1949, through Sept. 30, 1950, use of this insecticide was 39 million pounds, at the same time that hundreds of millions of pounds of other cotton dusts and sprays also were being employed.

This is an example of the general observation that well established insecticides are seldom completely displaced by newer chemicals. The latter extend the fields of insecticidal applications and of effective insect control generally without displacing entirely any older insecticide.

Dilution Important

Calcium arsenate generally is not diluted when applied to cotton as a dust, whereas the newer chemicals are diluted for dusting by grinding and mixing them with appropriate diluents of the general type of talc and pyrophyllite.



REDUCTION FROM FULL YIELD OF COTTON DUE TO BOLL WEEVIL

Dilution is such that, when 10 pounds of dust is applied per acre, as little as 0.25 to 0.5 lb. aldrin or 2.5 lb. technical benzene hexachloride will be utilized instead of 10 lb. calcium arsenate per application. The equivalent of well over 500 million pounds of cotton dusts on the basis of field strength was used in 1950 and this was over three times the 1949 consumption. This is notwithstanding the fact that both years were seasons of heavy infestation.

Although insect infestation of cotton was at a relatively low level in 1951, larger quantities of insecticides were applied during that year than during either of the two previous seasons of heavy infestations. Consumption of the materials fell off in 1952 but the quantity used has not yet been determined.

From Table 4 it will be noted that a preference exists for such well established newer chemicals as benzene hexachloride and toxaphene but without complete displacement of calcium arsenate.

Can't Be Sprayed

Calcium arsenate is not adapted to application on cotton as a spray, hence the established practice for many years has been to dust this insecticide on the plants. Since the development of organic chemicals for treatment of cotton it has been found that sprays are generally more advantageous. As a consequence approximately 30 per cent of the insecticides used in 1950 were applied as sprays. This proportion rose to about 45 per cent in 1951. Spray materials for use on cotton are supplied to the grower chiefly in the form of emulsifiable concentrates, in contrast to dusts which are furnished already diluted to field strength by commercial mixing plants.

The value of chemical control of insects is being appreciated more and more by growers as a form of crop insurance, and regularly scheduled applications are being made as a preventive measure. This practice has the effect of extending the use of insecticides and of stabilizing the quantities applied per crop acre.

For many years, apple growers have considered it essential to follow a definite spray program throughout the season.

Only since it has been demonstrated that the use of synthetic organic insecticides would result in more general elimination of insects on such crops as potatoes and cotton, have growers realized that here also regular preventive application will add to profits as well as provide insurance against heavy losses from insect damage in years favorable for development of these pests.

The more generally insecticides are applied and the more stable becomes the demand, the more readily can requirements be estimated ahead of use and adequate supplies be manufactured to meet demand. This trend will result in larger crop yields, with less danger of crop failure caused by insect pests. ◆

NFA and TVA combine efforts to estimate

The Cost of Producing 11-11-11 Nitraphosphate

ALL the talk in the fertilizer industry about manufacturing nitraphosphates has gotten past the speculative state.

A technical committee of the National Fertilizer Association got together with a similar committee from the Tennessee Valley Authority last month and put some figures down on paper to try to determine cost of producing an 11-11-11 grade nitraphosphate.

In a report prepared by the committees and distributed by NFA last month, figures were presented in detail for plants located in Sheffield, Ala.; Chicago and Baltimore.

Similar estimates for production of an 11-11-11 grade product by the conventional mixing process also were included.

Nitric-sulfuric Method

The report was concerned with production of the plant food by the nitric-sulfuric method in 50,000 and 200,000 ton per year plants.

The nitric-sulfuric process modification was chosen for initial study, the report stated, because it was believed that it would be of widest general interest to fertilizer manufacturers.

It added that comparable studies might show some of the other modifications of the nitraphosphate process more attractive economically, but that location and availability of raw materials all enter into the picture.

Presented in the report were costs of plant investment, production cost per ton of material and return on investment.

The table at the bottom of this page summarizes data on production of an 11-11-11 fertilizer under three conditions while the one on the next page gives a detailed breakdown of the cost of making the material by the various methods.

Cost estimates for nitraphosphates represent minimum estimates for the production of the materials, according to the report.

Based on 1-1-1 Ratio

Because the estimates were based on the production of a 1-1-1 ratio product, the committees believed the process was considered in its most favorable light "considering its lack of flexibility in producing a varied number of grades without sacrificing the inherent advantages of the process."

"It is also believed," the report went on, "that the production of such large quantities of a restricted number of grades of product might impose a marketing problem on the part of the producer."

The nitraphosphate estimates are based on purchased ammonia which is converted into nitric acid in a nitric acid plant operated in conjunction with the nitraphosphate processing plant.

Turn page for table of costs

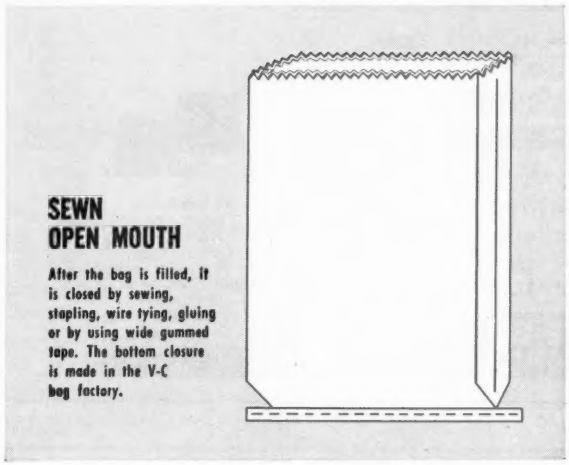
Summary of Data on Production of 11-11-11 Fertilizer

Item / Location	50,000 Ton/Year Conventional Mixing Plant			50,000 Ton/Year Nitric-Sulfuric Process			200,000 Ton/Year Nitric-Sulfuric Process		
	Sheffield, Alabama	Chicago, Illinois	Baltimore, Maryland	Sheffield, Alabama	Chicago, Illinois	Baltimore, Maryland	Sheffield, Alabama	Chicago, Illinois	Baltimore, Maryland
Plant Investment	$1,000,000	$1,000,000	$1,000,000	$2,800,000	$2,800,000	$2,800,000	$6,450,000	$6,450,000	$6,450,000
Production Cost/Ton	$53.05	$53.15	$53.45	$45.11	$49.17	$48.25	$40.40	$44.44	$43.55
Return on Investment	11.3%	11.1%	7.4%	9.6%	6.1%	5.9%	18.9%	12.9%	11.0%

Estimated Production Cost of 11-11-11 Fertilizer at Various Locations

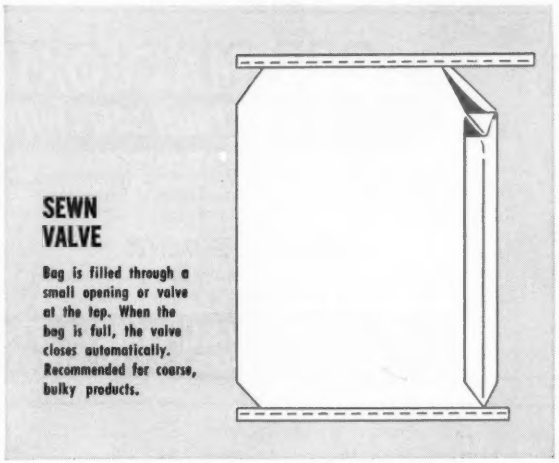
Item	Conventional Mixing Process 50,000 Tons/Year				Nitraphosphate Process 50,000 Tons/Year				Nitraphosphate Process 200,000 Tons/Year			
	Quantity	Dollars Per Ton			Quantity	Dollars Per Ton			Quantity	Dollars Per Ton		
		Sheffield, Alabama	Chicago, Illinois	Baltimore, Maryland		Sheffield, Alabama	Chicago, Illinois	Baltimore, Maryland		Sheffield, Alabama	Chicago, Illinois	Baltimore, Maryland
Rock Phosphate	—	—	—	—	0.337T	4.52	5.23	3.80	0.337T	4.52	5.23	3.80
Nitric Acid	—	—	—	—	0.252	8.61	10.10	10.12	0.252	8.13	9.60	9.65
Sulfuric Acid	—	—	—	—	0.137	2.88	3.02	3.02	0.137	2.88	3.02	3.02
Ammonia	—	—	—	—	0.072	5.80	6.96	6.91	0.072	5.80	6.96	6.91
KCl	0.183T	6.71	6.50	6.92	0.189	6.91	6.71	7.15	0.189	6.91	6.71	7.15
$(NH_4)_2SO_4$	0.4	18.86	18.57	19.40	—	—	—	—	—	—	—	—
Nitrogen Sol'n	0.075	4.38	4.41	4.26	—	—	—	—	—	—	—	—
Triple Super	0.168	9.25	9.43	9.29	—	—	—	—	—	—	—	—
Normal Super	0.173	3.29	3.55	2.86	—	—	—	—	—	—	—	—
Shrinkage	(1)	0.85	0.85	0.85	—	—	—	—	—	—	—	—
Bags	20	2.68	2.68	2.68	20	2.68	2.68	2.68	20	2.68	2.68	2.68
Fuel	—	0	0	0	3,510M BTU	1.05	1.43	1.43	3,510M BTU	1.05	1.43	1.43
Electricity	—	0.10	0.23	0.26	60 KWH	0.30	0.68	0.78	60 KWH	0.30	0.68	0.78
Operating Labor	—	1.90	1.90	1.90	1.24 Man-Hr	2.48	2.48	2.48	0.8 Man-Hr.	1.60	1.60	1.60
Lab. Analysis	—	0.05	0.05	0.05	—	0.33	0.33	0.33	—	0.33	0.33	0.33
Maintenance	7%	1.40	1.40	1.40	12%	3.60	3.60	3.60	12%	2.10	2.10	2.10
Yard Handling	—	0.20	0.20	0.20	—	0.20	0.20	0.20	—	0.20	0.20	0.20
Depreciation	7%	1.40	1.40	1.40	7%	2.10	2.10	2.10	7%	1.20	1.20	1.20
Misc. Supplies	—	0.05	0.05	0.05	—	0.10	0.10	0.10	—	0.10	0.10	0.10
Taxes and Insur.	(2)	0.63	0.63	0.63	(2)	0.80	0.80	0.80	(2)	0.55	0.55	0.55
Factory Overhead	—	1.30	1.30	1.30	—	2.00	2.00	2.00	—	1.30	1.30	1.30
Nitraphosphate Product Storage (3)	—	—	—	—	—	0.75	0.75	0.75	—	0.75	0.75	0.75
Total	—	$53.05	$53.15	$53.45		$45.11	$49.17	$48.25		$40.40	$44.44	$43.55

1. Two per cent of Raw Material Cost
2. Two per cent of Plant Investment Plus Inventory
3. Includes Depreciation, Insurance and Taxes and Maintenance



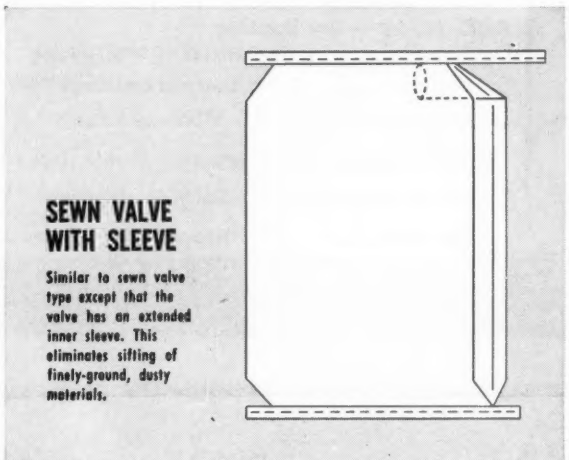
SEWN OPEN MOUTH

After the bag is filled, it is closed by sewing, stapling, wire tying, gluing or by using wide gummed tape. The bottom closure is made in the V-C bag factory.



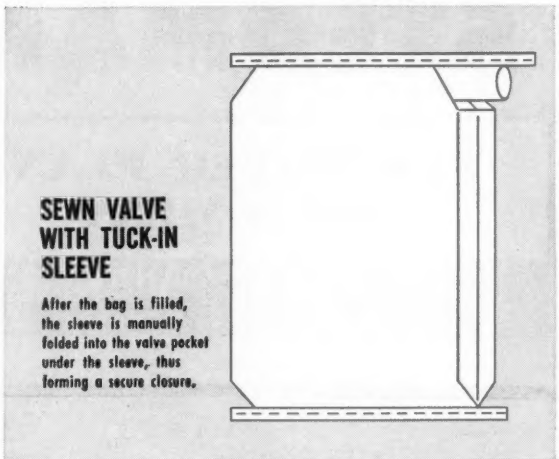
SEWN VALVE

Bag is filled through a small opening or valve at the top. When the bag is full, the valve closes automatically. Recommended for coarse, bulky products.



SEWN VALVE WITH SLEEVE

Similar to sewn valve type except that the valve has an extended inner sleeve. This eliminates sifting of finely-ground, dusty materials.



SEWN VALVE WITH TUCK-IN SLEEVE

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VC BAGS®

Industrial News

New York

March 10, 1953

Sulfate of Ammonia

This material was freed from price control about a week ago and already one producer has notified its customers it is raising the price $2 a ton from $44 to $46, f.o.b. Eastern production point. Stocks are adequate at most points and a considerable quantity of foreign sulfate is said to be in store at Southern ports.

Ammonium Nitrate

This material remains in tight supply and producers are currently shipping against existing orders but not booking any new business. Demand is good from various parts of the country.

Urea

Because of increased shipments from abroad, urea is slightly easier both in supply and price and is offered at $130 a ton, f.o.b. Atlantic ports for quick shipment. Domestic producers are sold out for this season.

Nitrogenous Tankage

Most producers were able to offer this material for quick shipment and the market was definitely easier although no price reductions have been reported. Demand for this material has slowed down considerably.

Organics

Organic fertilizer materials were rather easy pricewise because of lack of buying. At about this time of year, manufacturers generally place additional orders but this year because of the slow movement of fertilizer to the farms they are being rather cautious. Soybean meal after selling at $62 per ton, f.o.b. Decatur, about a month ago maintained a firm tone at $67 per ton. Linseed meal was on the easy side and selling on the basis of $70 a ton in bulk, f.o.b. Minneapolis. Cottonseed meal was being held back from the market by the C. C. C. with the result that offerings were rather scarce. There were rumors that this material would be offered at the market shortly, however.

Fish Meal

Imported material continued to dominate the market because of lack of domestic offerings. Current prices are about $125 to $130 per ton, f.o.b. various Atlantic and Gulf ports.

Bone Meal

This material was in plentiful supply with both feeding and fertilizer grades being offered for sale at prices around $70 a ton, f.o.b. shipping points. A shortage in some areas was reported of imported dicalcium phosphate.

Hoof Meal

This material is firm in price at about $6.90 per unit of ammonia ($8.39 per unit N) f.o.b. Chicago but most of it is being used for industrial purposes and is not going to the fertilizer trade.

Superphosphate

Mixers are slow to take delivery on contract but producers are hopeful the current month will see a large increase in shipments. A slight increase was made this week in the price of phosphate rock but so far this has not affected the price of superphosphate.

Potash

The movement of this material has picked up and one producer was reported slightly behind on shipments. Good stocks of imported potash were reported in store at Southern ports and no shortage of this material is looked for this season.

Castor Pomace

No change has been in the price of the domestic material but orders have been rather limited recently and material is available for quick shipment. Some imported material recently arrived at Southern ports and is being offered under the domestic market.

Philadelphia

March 10, 1953

There is very little doing at present in raw materials. Farmers are taking mixtures at a little better pace, though consumer orders as a whole are reported considerably behind last season at this time. Tankage continues down, and bone meal now is admittedly weaker. Contract shipments of sulfate of ammonia and potash are moving steadily, and superphosphate increasing. Some phosphate rock prices have been advanced.

Sulfate of Ammonia.— Deliveries of coke-oven are moving steadily on contracts, and liberal quantities of imported are obtainable. Production of synthetic grade has picked up materially. No recent price changes are noted.

Nitrate of Ammonia.— While production is heavier than ever, the supply position remains tighter and unable to meet the demand.

Nitrate of Soda.— Movement is fairly active with seasonal improvement in inquiries. Supplies are ample for all requirements.

Blood, Tankage, Bone.— Blood and tankage remain weak and almost entirely lacking in demand. Prices are nominal at $5 to $5.50 per unit of ammonia. ($6.08 to $6.80 per unit N). Steamed bone meal is now admittedly weaker and price, though presently reduced to $70, is nominal, there being little or no demand.

Castor Pomace.— Market is practically devoid of offerings or demand.

Fish Scrap.— Business exceedingly slow, stocks limited, and demand lacking. During past year

the imported tonnage of scrap and meal has been about equal to domestic production.

Phosphate Rock. — Demand is better and contract shipments are reported moving with increased activity. Some Florida prices said to have been advanced.

Superphosphate.— Movement on contracts is better but still not so good as usual at this season. Production of triple is increasing.

Potash.— Demand continues active for shipments against contracts. There is no shortage, and no price changes are reported.

Charleston

March 10, 1953

The delayed movement of mixed fertilizers has begun, and shortly fertilizer manufacturers will be busy at peak levels throughout the country, sharply increasing the demand for raw materials.

Organics.— Interest in organics for fertilizer use is spotty with the major producers of nitrogenous tankage heavily sold at prices ranging from $4.60 to $5 per unit of ammonia, ($5.59 to $6.08 per unit N) f.o.b. production points. Imported nitrogenous is in very limited supply at around $6 to $6.25 per unit of ammonia (7.29 to $7.59 per unit N), in bags, c.i.f. usual Atlantic ports.

Castor Pomace. — Demand is fairly active and domestic price unchanged at $37.25 a ton in burlap bags or $2 a ton less in paper bags, f.o.b. Northeastern production points. Analysis is minimum 6.75 per cent ammonia. Imported material varies in price from $36.50 to $43.50 per ton, depending on the quality.

Blood. — Domestic unground dried blood is indicated at Chicago at $5.50 to $5.75 per unit ammonia ($6.68 to $6.99 per unit N) in bulk. In New York the price is about $5.50 ($6.68 per unit N).

Potash.—Movement of domestic muriate of potash has increased recently and probably will advance in volume as the season progresses. Limited importations are planned for March/April arrival at usual Atlantic ports.

Ground Cotton Bur Ash.—This source of potash, primarily in the form of carbonate of potash, is available for prompt and spread shipment at prices approximating the delivered cost of domestic sulfate of potash. Analysis is usually 38 per cent to 45 per cent, averaging about 41 per cent K_2O.

Phosphate Rock.—Due to removal of price restrictions recently, the price of phosphate rock at Florida mines advanced slightly. Demand continues steady.

Superphosphate. — Movement continues somewhat behind but demand is increasing.

Stocks are comfortable and prices firm.

Sulfate of Ammonia.—Coke-oven production is heavily sold with a tendency towards tightness in supply. Prices remain firm. Imported material is available in limited quantity at stock points along the coast but could be easily taken up by a slight surge in demand.

Nitrate of Soda.—Demand has increased but stocks of imported material are adequate for the expected demand. No change in prices has been noted.

Nitrogen Solutions.—One of the major producers has been forced to curtail deliveries somewhat, due to plant difficulties, and the situation is quite tight.

Calcium Ammonium Nitrate.—Vessels from abroad continue to arrive periodically carrying various brands of this 20.5 per cent nitrogen material.

Current price is $51.25 a ton, in bags, f.o.b. cars at ports on the Atlantic and in the Gulf.

Industrial News

New Products **New Plants** **New Appointments**

Beasley, Mitchelson Join Spencer Staff

A. B. Beasley and Billy Mitchelson have been added to the agronomy staff of Spencer Chemical Co.

Beasley

Beasley will live in Memphis, Tenn., and serve in the Mid-South district, while Mitchelson will live in Minneapolis, Minn. and work in the North-Central district.

Beasley formerly was an agronomist with the Mid-South Soils & Farm Service. Previously he taught agonomy at the University of Tennessee, and served on the Soil Conservation Service from1944 to 1947.

Mitchelson

Also a former member of the Soil Conversavation Service, Mitchelson was graduated from Kansas State College in 1950 with a B.S. dedegree in agronomy. He worked with Charles Pfizer & Co. before going to Spencer.

Beasley's area includes Kentucky, Tennessee, Mississippi and northern Louisiana, while Mitchelson will cover Minnesota, Iowa, Wisconsin and the Dakotas.

Parker Elected

Dr. Frank W. Parker of the Bureau of Plant Industry, Soils and Agricultural Engineering, USDA, has been named chairman of the National Soil and Fertilizer Research Committee for a three-year term, succeeding Dr. H. B. Peterson of Indiana.

The committee heard reports from the phosphorus, soil test, fertilizer and soil survey work groups.

Rep. Miller Describes His Bill To Regulate Pesticides

IN A special statement to FARM CHEMICALS prior to introducing his legislation into Congress, Rep. A. L. Miller (R-Neb.) late last month described his proposed bills for regulating use of pesticides and other materials.

In answer to a query concerning the nature of the bills he has introduced in the House of Representatives, Rep. Miller said he thought his separate bills on chemicals in food, cosmetics and pesticides would be satisfactory to every one concerned.

"I have asked all interested parties to draft legislation which they feel is appropriate. They have done so and now their views have been incorporated into one piece of legislation which is agreeable to all," he declared.

In attempting to amend the Pure Food and Drug Act, present legislation in the field of pesticides and other chemicals, the Congressman said the present act "confuses the manufacturer by keeping him in doubt. By amending the act and establishing three separate sections I am sure it will do away with the uncertainty surrounding industry's position."

Rep. Miller, a member of the much-heralded Delaney committee which investigated the use of chemicals in and on foods, said he has held many conferences with representatives of the farm, chemical and manufacturing industries. One meeting had 34 groups represented, each giving recommendations for legislation.

"I am happy to report all of these groups are satisfied with the legislation, which I will introduce," he said.

Under the Pesticide-Residue amendment to the Federal Food, Drug and Cosmetic Act, the definition of pesticide is the same as that of the Federal Insecticide Act of 1947, which Miller says "has proved satisfactory to all concerned."

The proposed legislation does much to encourage scientific advancement by industry, which in the past has proved quite costly and in some instances made it prohibitive. First, the bill would condense all sections of the present act which have to do with pesticides and insecticides.

Next, the bill will provide an appeal to a panel of experts to determine whether a pesticide is safe if the administrator ruled otherwise. The present Act limits the appeal from the administrator's decision to that of having to prove the administrator acted arbitrarily or capriciously.

If both the administrator and panel feel the additive is not safe, the manufacturer is provided with the right to appeal to the courts. It is very unlikely that anyone who has been turned down by both the administrator and panel would appeal to the court, but this was done to protect industry's rights.

"It has long been American tradition to allow recourse to the courts. With the Pure Food and Drug Act, this tradition which had become a right was eliminated," Miller noted.

Other new aspects of the amendment require industry to furnish proof that the additive is safe and require the administrator to act within 90 days on any application. The latter will be highly beneficial to industry since they will know whether they should go ahead with production and need not fear being caught with stockpiles of pesticides which the administrator feels are not safe, according to Miller.

In the past, the administrator could wait indefinitely before ruling on an application.

VII advantages

of the ST-GOBAIN Process for the Manufacture of Complete Nitrophosphate Fertilizers

1. The St-Gobain process manufactures granulated fertilizers in one continuous automatic operation. The same equipment can be used to produce various $N\text{-}P_2O_5\text{-}K_2O$ formulae.
2. Can produce end product in any sized granules desired.
3. St-Gobain plants are available in capacities of 30,000 tons of produced nitro-phosphates per year and up.
4. You benefit from improvements and experience of many years of successful operation on a large industrial scale.
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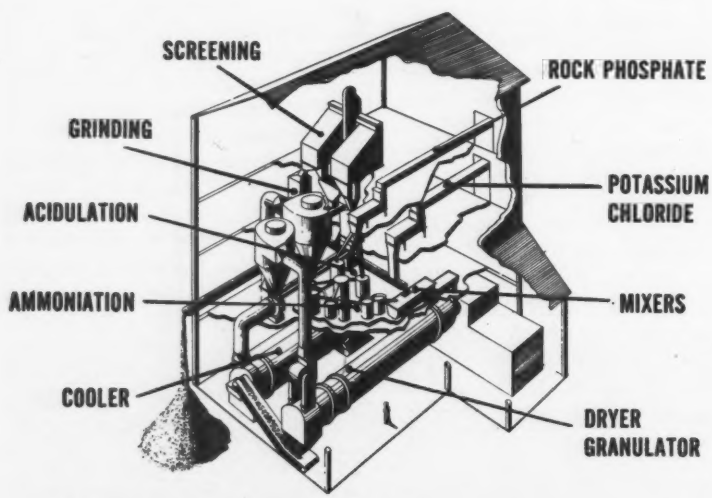
6. Capital investment is low due to the use of simple equipment.
7. Operating costs are low due to a continuous automatic operation and high yields.



Examples of Formulae Produced by St-Gobain Process

N%	P_2O_5%	K_2O%	
10	10	17	(sulfo-nitric acidulation)
11	11	11	" " "
10	15	20	(phospho-nitric acidulation)
12	15	18	" " "
12	12	20	" " "
14	14	14	" " "
10	20	20	" " "

For complete information write, wire or phone:

GENERAL INDUSTRIAL DEVELOPMENT CORP.
270 PARK AVE., NEW YORK 17, N. Y.
AGENTS FOR ST-GOBAIN PROCESS

Industrial News

Soil Conditioner Meeting Canceled

Manufacturers of soil conditioners won't get together in a trade practice conference this spring as originally planned, the Federal Trade Commission announced.

Reason for the delay, according to the Commission, was to "permit adequate consideration and appraisal of the results obtained through use of the various products, and the conditions and limitations related to such use."

Industry members had requested the conference following an FTC complaint filed against one of the soil conditioners last year.

In announcing the postponement the Commission issued a warning to manufacturers to avoid the following claims to which it said it is giving particular attention in studying the soil conditioner field:

1. "The advertising of chemical soil conditioners so as to leave the impression that remarkably good results can be obtained regardless of what kind of soil the purchaser may desire to treat with the product."
2. "Failure to disclose in advertising that for optimum results soil must be prepared (tilled) and in most cases the product mixed with the soil."
3. "Failure to disclose related facts such as the quantity of the product necessary to be applied to a given area for best results."
4. "Advertising an industry product so as to create an erroneous impression that the over all benefits derived from the use of the product equal or surpass that of peat moss."

Mayfield Joins Corn King

Corn King Co., pesticide manufacturers, got a new director of research and development last month when Dr. Orley J. Mayfield joined the staff.

Barlow said Corn King will move all its operations to the Cedar Rapids, Iowa, plant and offices, closing the Dr. Mayfield laboratories at Charles City.

New Pesticide Book

A comprehensive book called "Insect Fungus and Weed Control" was issued last month by Chemical Publishing Co.

The text, authored by E. R. de Ong, consulting entomologist and agricultural technologist, covers a wide range of subjects of interest to the pesticide industry. Beginning with a general introduction on the background of chemicals for plant protection, the 400 page volume goes on to describe sprays and dusts, application equipment, labeling, organic insecticides, inorganic fungicides, fumigants and other topics.

Included also in the illustrated text are recommendations from authorities and data on pertinent research in the field. List price is $10.

Industrial News

Fertilizer Outlook Seen Dim in Europe

Fertilizer manufacturers in the United States aren't the only ones who have their worries. That's the gist of remarks made by a prominent leader after a recent trip to Europe.

James E. Totman, president of Summers Fertilizer Co. and active for many years in the National Fertilizer Association, made the trip with his wife.

The two-month journey included a Mediterranean cruise and business trip to Cairo, Madrid and Paris.

Totman reported that overproduction of certain fertilizer raw materials has caused troubles in Western Europe. The situation resulted in part, he said, from the rapid expansion of productive facilities plus a restricted domestic and export demand.

Hope that Eastern European markets soon would become available was expressed by some of the superphosphate and potash producers in the western region, he added.

Also of interest is the fact that many superphosphate plants in Belgium and France have been closed with the result that a heavy accumulation of basic slag is developing.

Before the war the situation was alleviated by purchase of fertilizer materials by Eastern Germany, Poland and Czechoslovakia. With sulfuric acid also in surplus supply, Totman concluded, the European picture is far from bright.

4-1 Automatic Fertilizer Scale

An automatic scale, specifically designed for fertilizer, has been developed by Richardson Scale Co.

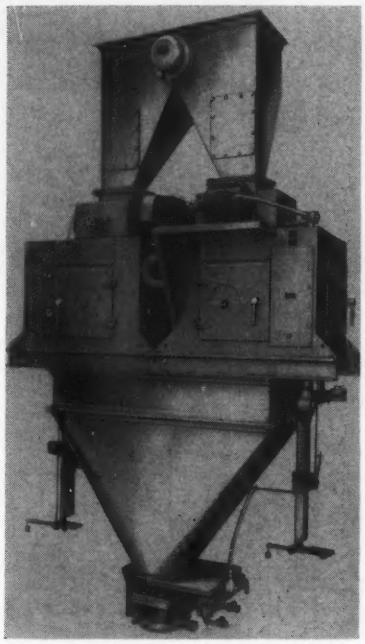
The instrument will weigh and deliver fertilizer products in open-mouth paper bags, at higher speeds and accuracies than has been possible before, the company asserts.

It is available in three models: single, duplex and triplex weighing machines. The single scale bags 35 tons of product an hour; the duplex, 70 tons an hour, using 50-, 80- or 100-lb. bags. The triplex scale turns out filled bags as fast as any operator can handle them, Richardson says.

Biggest advantage of the triplex model is its potential high accuracy. All things being equal, the company states, this model will be three times more accurate than the single scale at a given speed.

Two automatic bagging scales are included in the duplex model. They discharge alternately into a single bagging hopper.

Another feature of the scales is a corrosion-preventive construction. To prevent fertilizer corrosion the inlet chute and gate, weigh hopper, bag spout, all operating parts, bearings, pivots and agitators are made of stainless steel.



Richardson Automatic Scale

All other platework is protected by corrosion-resistant enamel. To get more information on the automatic fertilizer scales, fill out a Reader Service Card, using **Code Number 4-1.**

CSMA Attacks Proposed Pesticide Legislation

Proposed federal legislation aimed at placing greater control over the pesticide and other industries was attacked last month by the Chemical Specialities Manufacturers Association.

The group also opposed two bills pending in state legislatures in a monthly legislative report.

Of special interest to the industry is the group's announced opposition to H. R. 2245, otherwise known as the Delaney bill, and H. R. 620. The latter legislation would amend the Federal Insecticide, Fungicide and Rodenticide Act to require labeling of pesticides with the name and percentage of each ingredient and names and total percentage of inert ingredients.

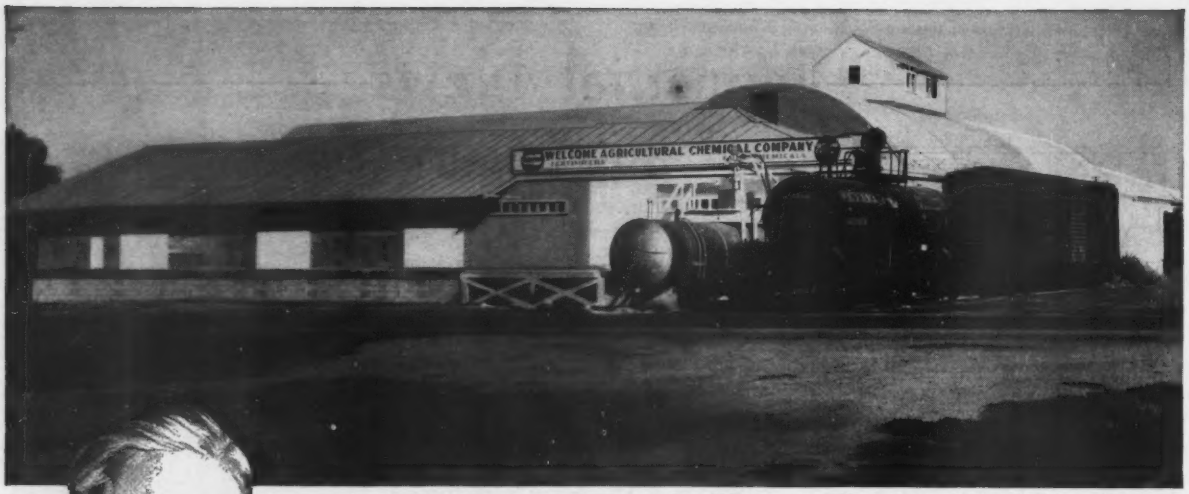
The state bills would provide stronger controls over sale of pesticides in Massachusetts and Washington.

IMC Drops International Allocations on Sulfur

Dropping of international allocations of the free-world supplies of sulfur was announced last month by the International Materials Conference. The move was made on recommendation of the sulfur committee of the Conference.

Substantial improvement in the sulfur supply situation was credited as the cause of the action. The committee review of the situation indicated that there are prospects for a reasonable balance between world supply and demand.

The announcement of the ending of allocations came as no surprise to the industry, inasmuch as the National Production Authority revoked all domestic controls over the material several months ago.

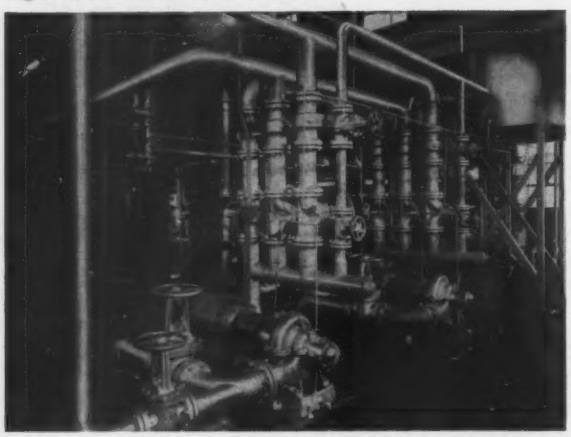


In the heart of the corn belt at Welcome, Minnesota, this highly efficient plant supplies fertilizer to some of the top corn producing counties of Minnesota, Iowa and the Dakotas. Established in 1949, Welcome has expanded each year since. In addition to a line of quality mixed fertilizers, Welcome offers, through dealers, a complete fertilizer spreading service.

A. J. Schuler is president and manager of Welcome Agricultural Chemical Co.

Welcome Agricultural Chemical Company

...Another Spensol User



From plants like this, Spensol (Spencer Nitrogen Solutions) is shipped direct to your plant. Dependable service and quality have made Spensol the choice of many of America's famous mixers.

These technical service experts specialize in finding the right answer to your production problems —even if you are not a Spencer customer. There's no charge or obligation for this Spencer service.

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America's Growing Name in Chemicals

Industrial News

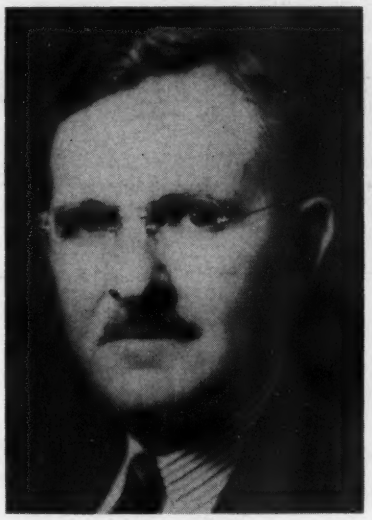
Weller Noble Tells of Early Days in Industry

Praises Work of NFA, Cal. Group

HIGH praise for the National Fertilizer Association and the California Fertilizer Association was sounded last month by one of the pioneers of the fertilizer industry.

Weller Noble, who retired April 1 as president and general manager of Pacific Guano Co., praised the fertilizer trade organizations in a letter to FARM CHEMICALS.

This magazine asked the West Coast official to relate some of his views on the growth of the industry and its associations during his 45 years in the business since 1908.



Weller Noble

Pasture Usage

"One of the outstanding developments which can be credited largely to the activities of NFA has been the new use of fertilizer for pasture fertilization," he stated.

"This program was initiated by NFA and has received such fine backing that pasture fertilization has become one of the larger programs in our agricultural development and has been a boon not only to the farmer, but to the fertilizer manufacturer."

Noble has been an NFA director since 1927. He has seen a "steady advance in the use of fertilizer and the promotion of public good will and confidence in the industry."

Noble also is a charter member of the California association, which was organized in 1922 and "filled a very definite need in the industry."

California Unit

Like the NFA, Noble writes, "it has, to a very considerable degree, promoted confidence and respect on the part of the buyer and the scientists in California and the entire organization of the fertilizer industry."

Noble headed the California group for many years.

Big changes naturally have come about since the day in 1908 that Noble started as a laborer in the Los Angeles plant of Pacific Guano.

Total sale of fertilizer in the state that year, for instance, was 33,000 tons, almost all of it for use on citrus culture. During 1952 the figure will be many times that total, approximately 750,000 tons.

Noble credits the increase in volume since 1908 largely to extended usage on truck crops and cotton.

Varied Activity

During his years at Pacific Noble's duties covered virtually every phase of the operations at the company. He had been factory foreman, superintendent, bookkeeper, chemist, purchasing agent, salesman and sales manager.

An important factor contributing to increased fertilizer usage has been the paving of highways, according to Noble.

"Prior to 1915," he writes, "there were very few paved roads in California. Agriculture has moved forward as highways have been built, permitting accessibility to remote areas in handling materials to the farms and in the marketing of crops."

Whereas in the early days in California all fertilizers were delivered by rail freight, trucks now account for 75 per cent of all deliveries, he estimates.

Noble has seen other dramatic changes during his stay at Pacific.

He notes that "Hollywood is in the center of what was once a very splendid lemon growing area and Beverly Hills once was a bean growing area." He added that the first large commercial motion picture studio was built in North Hollywood in 1910 when that place was the center of a peach and apricot territory.

Chemical Plants Safer Than Homes, Autos

A fact many safety-minded companies in the farm chemicals industry have been stressing for a long time was reiterated by the Manufacturing Chemists Association safety committee last month.

"Employes of chemical plants are safer at work than they are at home or driving their automobiles," Robert H. Albisser, chairman of the committee, reported in announcing that the chemical industry had set a new all-time safety record in 1952.

As recorded by the association's industrial injury reporting service, lost-time accidents last year totaled 4.10 per million man-hours worked, the lowest figure in the history of the industry and a 15 per cent improvement over 1951.

Chase Promotes Conners

Promotion of R. N. Conners to executive vice president and W. N. Brock to general sales manager highlighted a meeting of Chase Bag Co. managers and sales managers Feb. 23–25.

The annual meeting was held in Chicago. All managers and sales managers of the company attended.

Martin Joins Hammond

G. A. Martin has joined Hammond Bag & Paper Co. as a special sales representative for Michigan, Ohio, Kentucky and southern West Virginia. He will work out of Hammond's general office at Wellsburg, W. Va.

Industrial News

OPS Drops All Industry Controls

Price controls were a thing of the past in the fertilizer and pesticide industries by the middle of March.

Price decontrol actions released by the Office of Price Stabilization decontrolled fertilizer materials and mixtures, herbicides, insecticides and other pesticide materials.

Still under control, however, are sulfur and sulfur chemicals, important products to most companies in the industry.

Lea Hitchner, executive secretary of the National Agricultural Chemicals Association, said he expected "no particular effect on availability or prices of pesticides" to arise from the OPS directive.

"Insecticides, fungicides and weed killers are in adequate supply at the present time and prices are well below the ceilings in all cases," he stated.

Black at Freeport

Peter Black is new assistant to Langbourne M. Williams, president of Freeport Sulphur Co.

Black until recently was assistant to Henry H. Fowler, director of the Office of Defense Mobilization. A graduate of Harvard, he served in the Navy in the Pacific during World War II.

He was named special assistant to NPA and DPA administrator Manly Fleischmann.

US Industrial Chemicals Makes Seed Treatment

U. S. Industrial Chemicals Co. announces that it is distributing a slurry seed treatment using Pyrenone for the first time this year.

It marks an advance over the company's grain protectant with the same chemical which was first marketed in 1950.

4-2 Hyster Lift Trucks

Hyster Model 20 2000-pound lift truck

Both pesticide and fertilizer plants have found wide use for the Hyster Model 20 2000-pound capacity lift truck, the company reports.

Reasons for the popularity are its light weight, making it ideal for use inside buildings, truck vans and box cars and its high maneuverability (it is able to turn 360 degrees in little more than its own length).

The standard model has a lift height of nine feet to the bottom of the load. A free-lift is available which allows the truck to lift loads to maximum height where ceilings are limited.

For further information on the Model 20 truck and other models in the Hyster line, fill out a **Reader Service** card, using **Code Number 4-2.**

New Moth-Protectant Only for Washables

USDA officials reiterated last month that the new moth-proofing chemical EQ-53 developed by the department and soon to go into commercial production has not been recommended for use on furs, suits, coats and other woolens and materials that cannot be washed.

April 18 is the date set by USDA for industry to start any public advertising which they may plan for the product.

(FARM CHEMICALS broke the news about EQ-53 in the January, 1953 issue).

When available on the market the department stated, EQ-53, essentially a DDT mixture, will take its place among such recognized wool protectors as moth crystals and flakes, fluoride-type mothproofing solutions and residual sprays.

The product is added directly to wash or rinse water in the washing machine.

Washable woolens, such as sweaters and socks, are impregnated with DDT as they are washed and rinsed.

Protection is gained for at least a year, the USDA stated.

AVAILABLE NOW

Good news! Phillips *66* Ammonium Sulfate is available *now!* It is *dry-cured.* Dry-curing removes excess moisture—prevents caking. Uniform crystals flow freely—mix easily. Contains 21% nitrogen. Ideal for mixed goods manufacture and for direct application for all farm crops.

Contact us now for immediate shipment of bulk or bagged Phillips *66* Ammonium Sulfate.

Phillips also produces Nitrogen Solutions, Ammonium Nitrate, and Anhydrous Ammonia. Write our nearest district office for full information.

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HOUSTON, TEX.—604 City National Bank Bldg. • AMARILLO, TEX.—First National Bank Bldg. • OMAHA, NEB.—WOW Bldg.
PASADENA, CALIF.—604 Citizens Bank Bldg. • NEW YORK, N. Y.—80 Broadway • BARTLESVILLE, OKLA.—Adams Bldg.

Industrial News

Stauffer Builds Plant To Make New Fertilizer

Stauffer Chemical Co. will manufacture their new chemical fertilizer containing ammoniacal nitrogen and phosphorus at a plant under construction at Tacoma, Wash.

Wilson & Geo. Meyer & Co. will distribute the material. Stauffer's plant is next to the company's single super phosphate plant at Tacoma.

The new plant food will be made by a process developed and patented by Rumianca, Societa per Azioni of Turin, Italy, and licensed exclusively in the U. S. to Stauffer. By means of sublicense it will be offered to other producers in this country.

Stauffer explained that the process can be varied to produce a granulated material containing between five and 10 per cent nitrogen and 10 to 15 per cent phosphoric acid.

Exact composition of the product will depend on a market survey now underway.

The plant is scheduled to be completed late this year.

Phillips Unit to Make More Solid Fertilizer

Additional quantities of fertilizer in the solid form will be made possible by construction planned by Phillips Petroleum Co.

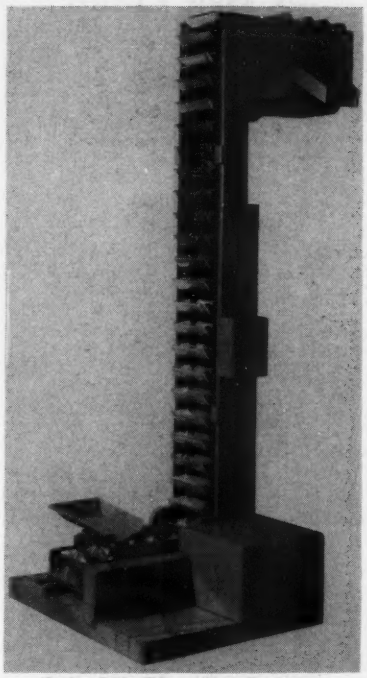
The company has started construction of facilities to increase its nitric acid capacity by 110 tons a day. Construction is progressing at the Cactus plant, Etter, Tex.

Present government-owned nitric acid facilities are operated under lease by Phillips Chemical Co., a wholly owned subsidiary. The new construction will be owned and operated by the subsidiary. The plant is expected to be completed late this year.

Increased production of fertilizer will help meet the USDA's priority for solid fertilizer, the company stated.

Since 1948, when the Etter plant was leased by Phillips, the company has doubled in size.

4-3 Robo-Lift



Robo-Lift Elevating Conveyer

Pesticide manufacturers may be interested in a standard elevating conveyor called the Robo-Lift. The machine is manufactured by Counsel Machine Co., Inc. for handling many free-flowing solids and powders.

Pesticide dusts and wettable powders could be handled by the equipment.

The product is fed into stainless steel buckets by vibratory action. Nine models are available, with capacities ranging from 1.42 to 24.3 cu. ft. per minute, elevating at angles of 70 to 90 degrees.

Available also are the "Under-Dump" and the "Proportioning" models.

For further information on the Robo-Lift models, fill out a **Reader Service** card, using **Code Number 4-3.**

Anderson Retires

The man who has headed tobacco research work in Connecticut for more than a quarter of a century, Dr. Paul J. Anderson, retired as chief of the tobacco laboratory of the experiment station effective April 1. His post will be filled temporarily by William L. Slate, director emeritus of the station.

Commercial Solvents Betters Position in '52

Commercial Solvents Corp. gradually is obtaining an enviable position that any farm chemical manufacturer would admire.

The corporation's long-range plans should make it more and more independent of fluctuating market conditions in any one field, according to J. Albert Woods, president.

The corporation's expansion and development will give it a diversity that will guarantee stability in times of minor fluctuations in certain areas, Woods stated in the recently issued financial report for the organization.

He said $11,572,284 was spent by the corporation during the past year for expansion and that an additional $12,300,000 will be spent this year for new equipment and facilities.

Net income was $1,368,392, equal to 52 cents a share. This was a drop from 1951 when the corporation earned $5,842, 444, or $2.22 a share.

Ethyl Making 2, 4, 5-T

Ethyl Corporation announced last month it is producing commercial quantities of the herbicide 2, 4, 5-T, which has been proved to be highly effective against mesquite, poison ivy and other woody plants.

The company is producing the herbicide as the acid and as the butoxy-ethoxy propanol ester for the preparation of low volatile ester formulations.

Ethyl also is a leading producer of BHC.

New Crag Package

Packaging of Crag Herbicide-1 in four-ounce containers for home garden use is announced for the 1953 season by Union Carbide and Carbon Corp.

Company says that amount is enough to control weeds in a 3,000 sq. ft. garden for three to six weeks. The material works through the soil and not on plant leaves so it can be used in the garden without damaging established plants.

Industrial News

USDA Tests Seven New Herbicide Compounds

The USDA, using chemicals supplied by the pesticide industry, found seven new compounds holding unusual promise as herbicides, the Department reports.

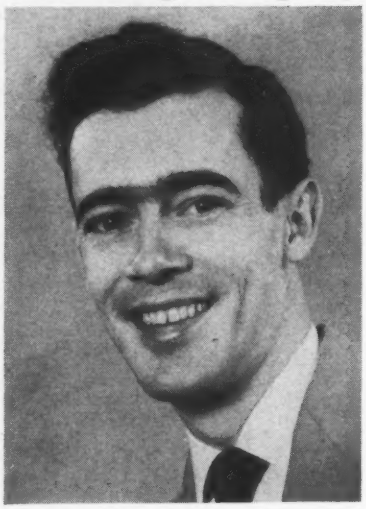
But fundamental and, applied research studies under field conditions are needed to determine proper use.

Evaluation work conducted by Dr. W. C. Shaw and C. R. Swanson at the Plant Industry Station, Beltsville, Md., showed the potentials of the weed killers.

More than 300 compounds in all were studied by the Department to determine effective weapons against weeds.

Excellent promise for preemergence treatment for control of weeds in cotton, soybeans and other crops are carbamate derivatives. They are isopropyl N-(3-methylphenyl) carbamate; isopropyl N-(3-chloro-6-methylphenyl) carbamate; isopropyl N-(3-chloro-6-methoxyphenyl) carbamate, *sec* butyl N-phenyl carbamate and *sec* butyl N-(3-chlorophenyl) carbamate.

Joins Bag Company



W. F. Nesbit

New sales representative in the Texas area for the Southern Division of Arkell and Smiths is James A. Schoenstein. Schoenstein replaces W. F. Nesbit for the paper bag manufacturers. Nesbit recently was appointed sales manager of the Eastern Division of the company, with headquarters in New York City.

4-4 New Sabin One-Man Truck

You can cut down manpower in your plant by using a Sabin L-3 One-Man truck, the Sabin Machine Co. claims.

With the truck one man can do the job that it usually takes three to do in moving barrels, drums and other material.

Loading is automatic, there is no manual lifting and the truck will handle up to 800 pounds.

The operator simply runs the truck up to the drum or barrel to be moved, slides an adjustable hook over the top chime, pulls back on the handle and the truck is loaded.

An extended foot pedal increases break-over leverage.

To get further information on the one-man truck, fill out a **Reader Service** card, using **Code Number 4-4.**

Gale To Transfer At American Potash

W. A. Gale, pioneer executive of American Potash & Chemical Corp. will leave the home office in Trona, Cal. after nearly 30 years and move to Whittier, Cal. in the near future.

He will be in charge of developing and supervising a new research laboratory nearing completion at Whittier.

He will continue to supervise over-all policy and program of the Trona laboratory as well as managing the new plant.

The corporation was called "American Trona Corp." when Gale joined it in 1923, after receiving his master's degree in chemistry and metallurgy from the University of British Columbia at Vancouver.

When the company was reorganized under its present name in 1927 Gale was named director of research.

In another personnel change, Julien Phillips was appointed associate director of research, with responsibility for operation and administration of the Trona lab.

Research work at the Eston Division of American Potash will be transferred to the Whittier lab, under the supervision of Dr. W. D. Peterson, assistant director of research for Eston Division projects.

Following other personnel changes were announced: Frank May to Whittier lab as assistant director of research, inorganic division; Ernest Levens will hold the same position in the organic division while Harold Kerry will shift to the Whittier lab, where he will be in charge of the analytical section.

Bradley & Baker Offices

Two new district sales offices at Indianapolis and Houston have been opened by Bradley & Baker. Heading the offices are Everett C. Horne, at Indianapolis and James K. Sparkman Jr., at Houston.

Horne formerly handled fertilizer sales in the company's St. Louis office. Thomas C. White replaces Horne at St. Louis.

Minimum Fertilizer Grades for 1953 Recommended by Agronomists to Fertilizer Industry at Meeting Sponsored by Middle West Soil Improvement Committee.

Straight Materials Supplying NPK. Production of Higher Grades Is Recommended.

RATIO	OHIO	IND.	ILL.	MICH.	WIS.	MINN.	IOWA	MO.	KY.	KANS.	NEBR.	S. DAK.	N. DAK.
0–1–3	0–10–30	0–10–30	0–10–30	0– 9–27	0–10–30	0– 9–27	0–10–30	0–10–30					
0–1–2	0–10–20	0–10–20	0–10–20	0–10–20	0–10–20	0–10–20		0–10–20	0–10–20				
0–1–1	0–16–16	0–16–16	0–20–20	0–12–12	0–20–20	0–20–20	0–20–20	0–20–20	0–12–12	0–20–20			
0–2–1	0–20–10	0–20–10		0–20–10	0–20–10	0–20–10	0–20–10	0–20–10	0–14– 7	0–20–10			0–20–10
1–6–3				3–18– 9				4–24–12		4–24–12	4–24–12	4–24–12	4–24–12
1–4–4	4–16–16	4–16–16	4–16–16	3–12–12	4–16–16	4–16–16	4–16–16	4–16–16	3–12–12				
1–4–2	4–16– 8	4–16– 8		4–16– 8	4–16– 8	4–16– 8	5–20–10	5–20–10	4–16– 8				
1–4–1				4–16– 4									
1–3–9			3– 9–27										
1–3–6	3– 9–18	3– 9–18		3– 9–18	3– 9–18	3– 9–18	3– 9–18	3– 9–18					
1–3–2	5–15–10	4–12– 8	5–15–10			5–15–10		5–15–10	4–12– 8				
1–3–1								8–24– 8		8–24– 8			
1–2–3									4– 8–12				
1–2–2	8–16–16	8–16–16			8–16–16	8–16–16	6–12–12		5–10–10				
1–2–1						10–20–10	10–20–10		5–10– 5	10–20–10	10–20–10	10–20–10	10–20–10
1–1–3					6– 6–18								
1–1–1	10–10–10	10–10–10	10–10–10	10–10–10	10–10–10	10–10–10	10–10–10	10–10–10	8– 8– 8	10–10–10			10–10–10
1–4–0		6–24– 0				6–24– 0	6–24– 0			6–24– 0	6–24– 0	6–24– 0	6–24– 0
1–3–0							10–30– 0	13–39– 0		13–39– 0	13–39– 0	13–39– 0	13–39– 0
1–2–0						10–20– 0	10–20– 0	10–20– 0		10–20– 0	10–20– 0	10–20– 0	10–20– 0
1–1–0						15–15– 0	15–15– 0	15–15– 0		15–15– 0	15–15– 0	15–15– 0	15–15– 0
2–1–1	12– 6– 6	12– 6– 6		12– 6– 6					12– 6– 6				
2–2–1												12–12– 6	12–12– 6

. . . Miller Chem. & Fert.

(*Continued from page 33*)

workers regularly receive blood tests to insure that their health is not being impaired by parathion.

Why does Miller handle a material that has such potential dangers?

Long says the obvious answer is that "it is such an effective insecticide that the hazards are justified. For so many insects parathion is one of the cheapest and most useful of all the insecticides."

(See last month's FARM CHEMICALS for a story on the packaging of parathion at the Miller plant. Page 26 in the March issue.)

Other important products at Miller are their water soluble fertilizers and their "Nutri-Leaf," similar to the former but dissolved in water and sprayed on plant foliage.

The water-soluble line has been featured for more than 10 years. Most of the material is used in transplanting, mainly for tomatoes. So successful has been the product, the company reports, that very few large tomato growers in the area now will put out their transplanted crops without a water-soluble fertilizer. The Miller product contains minor elements as well as NPK.

Fertilizer By Spray

"Nutri-Leaf" is a relatively recent addition to Miller's product list. Many large vegetable growers are finding the foliar sprays economical and profitable, according to Miller. It is added to the spray tank along with insecticides and fungicides for a joint application.

Further expansion of the company is planned with future plants for production of fertilizer and pesticides along the eastern seaboard.

Helping to shape company policy are the following other officers of the company: A. T. Bradley, Thomas L. Smith and A. G. Fischer, vice presidents; Jesse F. Miller, secretary; L. W. Cameron, treasurer and Clarence E. Carr, assistant treasurer. ◆

. . . NAC Convention

(*Continued from page 17*)

but recent development of highly toxic phosphorus compounds has renewed interest in this phase of the industry. Future possibilities of systemic insecticides are largely dependent upon developments in the field of biochemistry and insect physiology. Also necessary is a better understanding of the physiology of insects including the specific reactions of all the chemical changes taking place in the body of living insects. This would aid development of more effective and less hazardous insecticides, according to the speaker.

Johnston said Systox has been more extensively tested than any of the other systemics to date and now is available for commercial use.

Lumber Insect Control

Other talks, on forest and lumber insects, were presented by entomologists from the Bureau of Entomology and Plant Quarantine, USDA.

In the first talk, R. Joseph Kowal, senior entomologist in charge of the station, said epidemics of the pine defoliator have resulted in the killing of trees or a growth loss of timber totaling $4,200,000.

Kowal called for more fundamental research to help fight the forest insects.

H. R. Johnston, speaking on lumber insects, praised benzene hexachloride for control of ambrosia beetles, bark beetles and wood borers on green hardwood logs and lumber and on pine logs. He said application at the rate of 1¾ gamma isomer to 50 gallons of fuel oil is effective.

Also heard at the Friday morning session of the convention was a talk on NAC and the formulator and a forecast of "The Future of Agricultural Chemicals in the South." The former was given by James T. Conner Jr., entomologist for Taylor Chemical Co., the latter by Dr. Eugene Butler, vice president and editor of *Progressive Farmer*.

Joseph A. Noone, NAC technical adviser, reported that more than 150 bills affecting pesticides are up for consideration in 44 state legislatures. He explained the import of several of the bills and the indication of the trends which future legislation may take.

In another discussion by an association adviser, John D. Conner, NAC counsel, analyzed various types of claims filed against members of the industry and emphasized proper and safe use of pesticide products.

Presiding at the Wednesday session was Paul Mayfield, NAC vice president. Mohr was chairman for the concluding meeting Friday.

A golf tournament and tours of the city highlighted entertainment at the convention. ◆

Freeport Sulphur Had Record Earnings in '52

Production of sulfur was at a record high during 1952, as were net earnings of the company, Freeport Sulphur Co. stated in its 40th annual report to stockholders.

Net earnings totaled $7,325,750 or $3.05 a share of common stock, compared with $6,308,897 or $2.63 a share for the previous year.

Other progress noted in the report was opening of a new sulfur mine, development of two other mines and drilling at another property in a fourth mining project.

Granular Toxaphene Shows Good Results

A new granular form of toxaphene has been proved successful in early tests, Hercules Powder Co. reports.

The company makes the technical base for the potent toxaphene insecticides.

Correction

Tah-Ho Huang, author of the article on serpentine-fused phosphate (FARM CHEMICALS, Jan. '53, p. 41) pointed out in a recent letter an error in Table 4 which accompanied the article. It should have indicated that Al_2O_3 and Fe_2O_3 when combined are greater than 5.0, not that either constituent is higher than that figure.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

AGRICULTURAL CONSULTANTS
Bailey & Lerch, Washington, D. C.

ALDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

AMMONIA—Anhydrous and Liquor
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Lion Oil Co., El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM PHOSPHATE
Monsanto Chem. Co., St. Louis, Mo.

AMMONIUM SULFATE
See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE
Baker & Bro., H. J., New York City

BAGS—Burlap
Bemis Bros. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago
Mente & Co., Inc., New Orleans, La.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Multiwall-Paper
Bemis Bro. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., N. Y. C.
Hammond Bag & Paper Co., Wellsburg, W. Va.
Hudson Pulp & Paper Corp., N. Y. C.
Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
Mente & Co., Inc., New Orleans, La.
McIver & Son, Alex. M., Charleston, S. C.
Raymond Bag Co., Middletown, Ohio
Union Bag & Paper Corp., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
Fischbein Co., Dave, Minneapolis, Minn.
International Paper Co., Bagpak Div., N. Y. C.

BAG CLOSING—THREAD & TWINE
Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

BHC AND LINDANE
Ashcraft-Wilkinson Co., Atlanta, Ga..
Diamond Alkali Co., Newark, N. J.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Pittsburgh Agricultural Chemical Co., N. Y. C.

BONE PRODUCTS
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash and Chem. Corp., N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—Hoist, Crane, etc.
Hayward Company, The, New York City

CALCIUM ARSENATE
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.

CARS AND CART
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CHLORDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C
Pittsburgh Agricultural Chemical Co., N. Y. C.

CLAY
Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

CONTROL SYSTEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

CONVEYORS—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

COPPER SULFATE
Phelps Dodge Refining Corp., New York City
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa

DDT
Ashcraft-Wilkinson Co., Atlanta, Ga.
Diamond Alkali Co., Newark, N. J.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.

DIELDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

DILUENTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Agricultural Chemical Co., N. Y. C.

DITHIOCARBAMATES
Berkshire Chemicals, New York City
DuPont de Nemours & Co., E. I., Wilmington, Del.

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS—Bucket
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

EMULSIFIERS
Atlas Powder Co., Wilmington, Del.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
Fairlie, Inc., Andrew M., New York City
General Industrial Development Corp., N. Y. C.
Marietta Concrete Corporation, Marietta, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.
Titlestad Corporation, Nicolay, New York City

FERTILIZER—Mixed
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FILLERS
McIver & Son, Alex. M., Charleston, S. C.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston. S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH
Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES
American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals, New York City
DuPont de Nemours & Co., E. I., Wilmington, Del.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Tennessee Corp., Atlanta, Ga.

GAS MASKS
Willson Products, Inc., Reading, Pa.

GOGGLES
Willson Products, Inc., Reading, Pa.

HERBICIDES
Diamond Alkali Co., Newark, N. J.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

HERBICIDES—Oils
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind..

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
DuPont de Nemours & Co., E. I., Wilmington, Del.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Diamond Alkali Co., Newark, N. J.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Powell & Co., John, New York City
U. S. Industrial Chemicals Co., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

IRON SULFATE
Tennessee Corp., Atlanta, Ga.

LEAD ARSENATE
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.

LIMESTONE
American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio
Pittsburgh Agricultural Chemical Co., N. Y. C.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

LOADERS—Car and Wagon
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating
Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Granulating, Fertilizer
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Hayward Company, The, New York City
Hough, The Frank G. Co., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Mixing, Screening and Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY
Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MAGNESIUM SULFATE
Berkshire Chemicals, New York City

MANGANESE SULFATE
McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corp., Atlanta, Ga.

MANURE SALTS
Potash Co. of America, Washington, D. C.

MINOR ELEMENTS
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

NITRATE OF POTASH
Berkshire Chemicals, New York City

NITRATE OF SODA
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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

NITROGEN MATERIALS—Organic
American Agriculture Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION
Ashcraft-Wilkinson Co., Atlanta, Ga.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.

PENTACHLOROPHENOL
Monsanto Chemical Co., St. Louis, Mo.

PHOSPHATE ROCK
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Monsanto Chemical Co., St. Louis, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
General Industrial Development Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Titlestad Corporation Nicolay, New York City

POTASH—Muriate
American Potash & Chemical Corp., N. Y. C.
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, Washington, D. C.
Southwest Potash Corp., New York City
United States Potash Co., N. Y. C.

POTASH—Sulfate
American Potash & Chemical Corp., N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, Washington, D. C.

POTASSIUM PHOSPHATE
Monsanto Chemical Co., St. Louis, Mo.

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PYROPHYLLITE
Ashcraft-Wilkinson Co., Atlanta, Ga.

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Stedman Foundry and Machine Co., Aurora, Ind.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

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Goodrich Chemical Co., B. F., Cleveland, Ohio

SPRAYS
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STORAGE BUILDINGS
Marietta Concrete Corporation, Marietta, Ohio

SULFATE OF AMMONIA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
United States Steel Corp., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA
International Min. & Chem. Corp., Chicago, Ill.

SULFUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying
Ashcraft-Wilkinson Co., Atlanta, Ga.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC
Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TEPP
Monsanto Chemical Co., St. Louis, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.

TOXAPHENE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Pittsburgh Agricultural Chemical Co., N. Y. C.

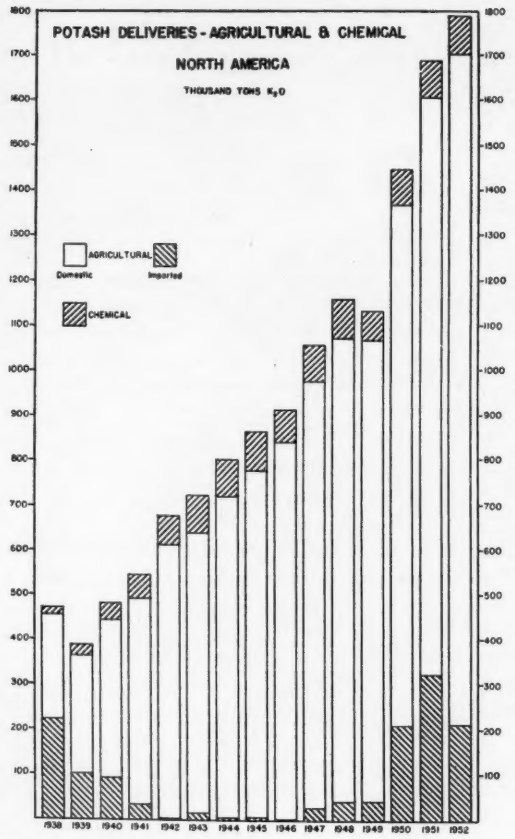
2, 4-D
Diamond Alkali Co., Newark, N. J.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

2, 4, 5-T
Diamond Alkali Co., Newark, N. J.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

UREA & UREA PRODUCTS
DuPont de Nemours & Co., E. I., Wilmington, Del.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C

VALVES
Atlanta Utility Works, The, East Point, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.

ZINC SULFATE
Tennessee Corp., Atlanta, Ga.



Potash Sets Record

POTASH deliveries in North America again set a record in 1952 and continued the upward trend of recent years (see graph above).

Total for last year was 3,118,489 tons of salts containing an equivalent of 1,796,258 tons K_2O, an increase of 88,733 tons K_2O, five per cent more than 1951.

Accordingly, deliveries by the seven leading domestic producers of the plant food were the highest ever achieved; 1,584,698 tons of K_2O, an increase 15 per cent over the previous year.

The increase was attributed to two new producing companies in New Mexico and an increase in deliveries by the older companies, according to the American Potash Institute, which released the figures. Imports totaled 211,560 tons of K_2O, a drop of 35 per cent from 1951.

The Institute reported that deliveries for agricultural purposes in the continental United States for 1952 were 1,592 tons of K_2O, an increase of 102,442 tons over the previous year.

Foreign countries receiving potash had the following totals: Canada, 69,968 tons; Cuba, 9,408; Puerto Rico, 17,068 and Hawaii, 16,451.

Potash for farming was delivered to 44 states and the District of Columbia. Leading the states was Illionois with more than 168,000 tons K_2O. Following were Ohio, Georgia, Indiana, Virginia, Florida and North Carolina. ◆

Alphabetical List of Advertisers

The 'Squeeze' Is On

THERE has been increasing talk in recent months about the ever-tightening "squeeze" being put on farmers.

It results from a drop in the prices farmers are receiving for their products coupled with a continuing increase in the cost of goods and services they need to produce their crops.

The National Soil Conservation Committee places the drop in farm prices at nine per cent for the past six months.

With such an ominous trend underway it is heartening to note that both the fertilizer and pesticide industries are aware of the situation and intend to do something about it, insofar as their relationship with the farmer is concerned.

A major portion of the pesticide industry, represented in the National Agricultural Chemicals Association, faced up to the situation last month at the annual spring convention of the NAC in New Orleans.

The troubles facing the pesticide manufacturers are two-fold. Not only is the buying power of the farmer gradually being decreased by the "squeeze," the problem is compounded by the large inventories of pesticides left over from the slack season in 1952.

Prices are low and there is little chance of any significant rise, according to those who know in the industry.

That was the basis for the stern warning by Arthur W. Mohr, NAC president, that 1953 almost certainly would be an unprofitable one for the industry. Prices on some chemicals, including DDT and benzene hexachloride, have dropped as much as 50 per cent. The over-supply situation which prevails in pesticide plants makes other price cuts probable.

The answer, of course, lies in educating the farmer to the advantages of using pesticides when the squeeze is on.

As Mohr put it, "doesn't it make sense that if, in time of low farm prices, a farmer fully protects his crops he has a much better chance for profit?" Mohr urged the industry to "get the proper facts to the millions of farmers who are permitting pests to eat into their income."

Mentioning just a few of those "proper facts," the association president said yields of peanuts could be nearly doubled by control of the corn rootworm, realizing a gain up to $200 an acre in some instances and an average increase in profit of approximately $100 an acre.

Mohr went on to state that "costs of weeding cotton with chemicals can be held to as little as $5 an acre whereas hand weeding may total three or four times that figure."

The association head presented some very important facts to the industry members attending the session, *but will they get to the persons who count, to the farmers who must be shown the value of using the pest control chemicals?*

That is a job the NAC and individual manufacturers must do if the situation is to be improved. It means preparing booklets and charts, giving talks to farm groups and assisting the USDA and other organizations in helping to educate farmers.

ALONG those lines the National Fertilizer Association took another big step publicity-wise last month in its drive to get farmers to watch their N's, P's and K's.

The association's striking new booklet, "Fertilizer—Cornerstone of the Welfare of the Nation," should do much to break down farmer resistance to new-fangled chemical fertilizers.

NFA has been stressing particularly the job bankers throughout the nation can do in lending money to farmers for the purchase of fertilizer and other farm chemicals.

But, like the NAC, the NFA faces stiff resistance to its campaign. For in attempting to make "borrowers and lenders" of farmers, the association is combatting both Shakespeare and human nature.

"Creation of the desire on the part of farmers to borrow sufficient funds to increase yields and profits per acre is a problem," the association states in the introduction to its booklet.

Breaking down deeply ingrained buyer resistance is no easy job. But continued dissemination of such booklets as NFA's most recent one will go a long way toward showing farmers just what they're missing in yields and profits.

—HAMILTON C. CARSON

•*Population trends*

With more people moving from the farms to join their cousins in the cities, American agriculture is facing the necessity of growing more food with less manpower. A recent survey claims that by 1975 our food requirements will be 25% greater than at present.

Potash Company of America, a prime producer, is proud of its contribution in materials and service, in support of the fertilizer industry's aid to our growing farm economy.

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Carlsbad, New Mexico

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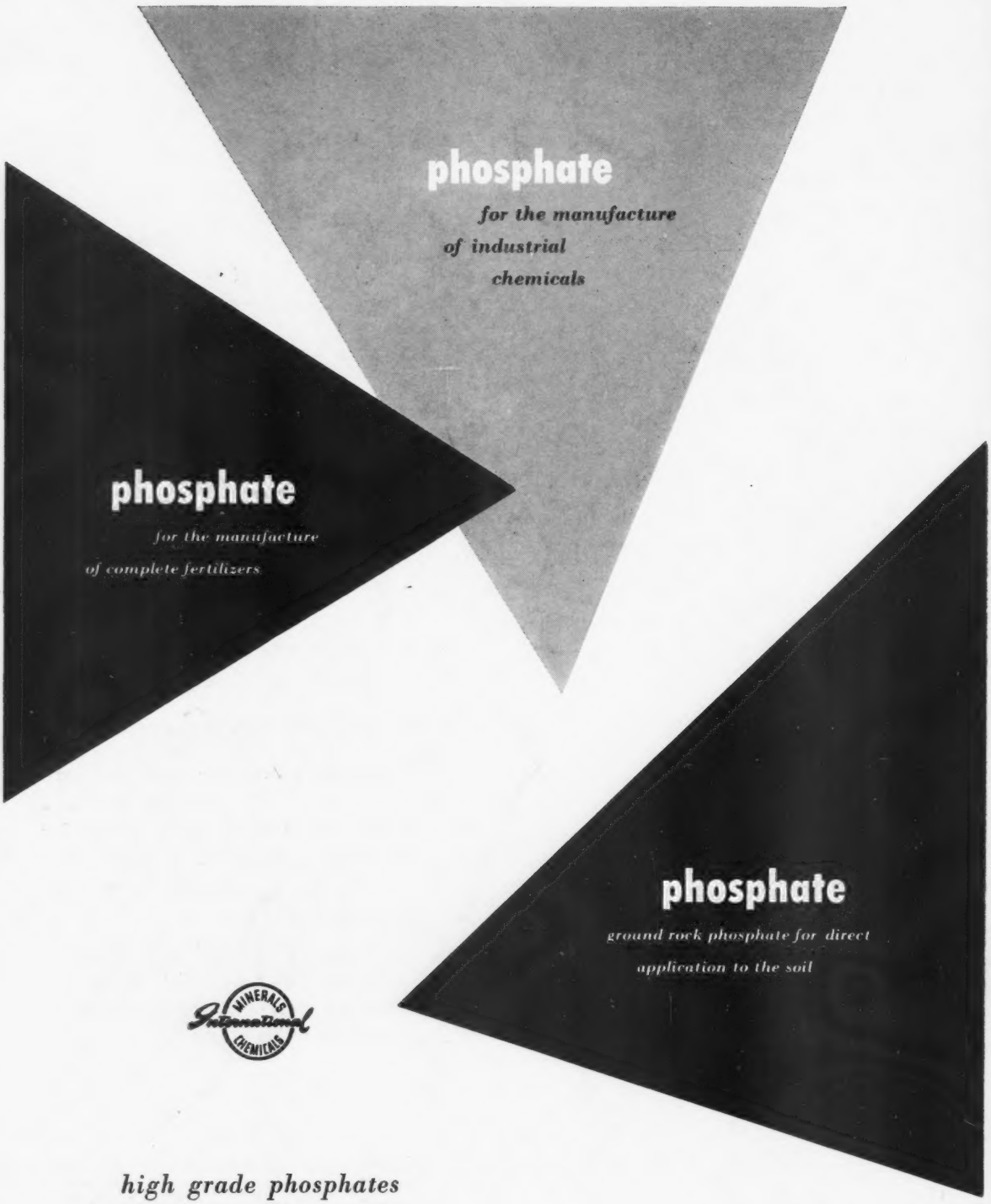

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